SAF-RC-048
100 Area and 300 Area Component of the RCBRA Water Sampling
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jill Thomson	H0-23	MJP 1-19-06 INITIAL/DATE
Jeanette Duncan	H9-02	MJP 1-19-06 INITIAL/DATE

COMMENTS:

SDG K0046 SAF-RC-048

Sample Location/Waste Site: **J107Y9 199-H4-5**
J10891 199-F5-6

Date: 3 January 2005
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 Area and 300 Area Component of the RCBRA Water Sampling
Subject: Radiochemistry - Data Package No. K0046-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0046 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Note
J10891	10/13/05	Water	C	See note 1
J107Y9	10/13/05	Water	C	See note 1

1 – Tritium, radium-226, radium-228, total strontium, isotopic thorium, isotopic uranium, gamma spectroscopy.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Water Sampling Plan (DOE/RL-2005, Rev. 0, October 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

· **Preparation (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

· **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 80-120%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

Due to the lack of an LCS analysis, all thorium-228 and thorium-232 results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

· **Laboratory Duplicates**

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate

analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 20%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicates

No field duplicates were submitted for analysis.

- **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the 100 & 300 Area RQLs to ensure that laboratory detection levels meet the required criteria. One analyte exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0046 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of an LCS analysis, all thorium-228 and thorium-232 results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

One analyte exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-2005, Rev. 0, October 2005, *100 Area and 300 Area Component of the RCBRA Water Sampling Plan*.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: [illegible]	REVIEWER: 1	PROJECT: RCRA	PAGE: 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Thorium-228 Thorium-232	J	All	No LCS analysis

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, WATER MATRIX, (PCi/L)

Project: WASHINGTO CLOSURE HANFORD					
Laboratory: EB					
Case	SDG: H3203				
Sample Number		J10891		J107Y9	
Remarks					
Sample Date		10/13/05		10/13/05	
Radiochemistry	RQL	Result	Q	Result	Q
Tritium	400	1970		2900	
Total Strontium	1	7.27		-0.176	U
Radium-228	3	1.53	U	-0.185	U
Thorium-228		-0.024	UJ	0.066	UJ
Thorium-230		0	U	0.065	U
Thorium-232	1	0	UJ	0	UJ
Uranium-233/234	1	3.48		2.51	
Uranium-235	1	0.254		0.185	U
Uranium-238	1	3.54		1.35	
Radium-226	1	0.916		0.818	U
Potassium-40		U	U	U	U
Cobalt 60	25	U	U	U	U
Cesium 137	15	U	U	U	U*
Radium-226		U	U	U	U
Radium-228		U	U	U	U
Europium 152		U	U	U	U
Europium 154		U	U	U	U
Europium 155		U	U	U	U
Thorium-228		U	U	U	U
Thorium-232		U	U	U	U
Uranium-235(gea)		U	U	U	U
Uranium-238(gea)		U	U	U	U
Americium-241(gea)		U	U	U	U
Ruthenium-106		U	U	U	U
Antimony-125		U	U	U	U
Beryllium-7		U	U	U	U
Cesium-134		U	U	U	U

000010

* - RQL exceeded

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize potential miss-interpretation of results. All other qualifiers shown were applied during validation.

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0046

7318-002 J10891

DATA SHEET

SDG	7318	Client/Case no	Hanford	SDG K0046	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R510084-02	Client sample id	J10891		
Dept sample id	7318-002	Location/Matrix	199-F5-6	WATER	
Received	10/14/05	Collected/Volume	10/13/05 11:11	7.0 L	
		Custody/SAF No	RC-048-6	RC-048	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	1970	150	170	400		H
Total Strontium	SR-RAD	7.27	0.83	0.63	2.0		SR
Radium 228	15262-20-1	1.53	1.0	1.8	3.0	U	AC
Thorium 228	14274-82-9	-0.024	0.048	0.18		U J	TH
Thorium 230	14269-63-7	0	0.095	0.18	1.0	U	TH
Thorium 232	TH-232	0	0.047	0.18	1.0	U J	TH
Uranium 233/234	U-233/234	3.48	0.68	0.20	1.0		U
Uranium 235	15117-96-1	0.254	0.19	0.24	1.0		U
Uranium 238	U-238	3.54	0.69	0.20	1.0		U
Radium 226	13982-63-3	0.916	0.95	1.5	2.0	U	RA
Potassium 40	13966-00-2	U		110		U	GAM
Cobalt 60	10198-40-0	U		9.2	25	U	GAM
Cesium 137	10045-97-3	U		10	15	U	GAM
Radium 226	13982-63-3	U		18		U	GAM
Radium 228	15262-20-1	U		41		U	GAM
Europium 152	14683-23-9	U		30	50	U	GAM
Europium 154	15585-10-1	U		27	50	U	GAM
Europium 155	14391-16-3	U		30	50	U	GAM
Thorium 228	14274-82-9	U		15		U	GAM
Thorium 232	TH-232	U		41		U	GAM
Uranium 235	15117-96-1	U		45		U	GAM
Uranium 238	U-238	U		1100		U	GAM
Americium 241	14596-10-2	U		46		U	GAM
Ruthenium 106	13967-48-1	U		79		U	GAM
Antimony 125	14234-35-6	U		25		U	GAM
Beryllium 7	13966-02-4	U		90		UX	GAM
Cesium 134	13967-70-9	U		13		U	GAM

100Area&300AreaComponentRCBRAWaterSa

11/2/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/19/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0046

7318-001 J107Y9

DATA SHEET

SDG	7318	Client/Case no	Hanford SDG K0046
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R510084-01	Client sample id	J107Y9
Dept sample id	7318-001	Location/Matrix	199-H4-5 WATER
Received	10/14/05	Collected/Volume	10/13/05 12:09 7.0 L
		Custody/SAF No	RC-048-3 RC-048

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALIFIERS	TEST
Tritium	10028-17-8	2900	170	170	400		H
Total Strontium	SR-RAD	-0.176	0.30	0.65	2.0	U	SR
Radium 228	15262-20-1	-0.185	0.73	2.0	3.0	U	AC
Thorium 228	14274-82-9	0.066	0.066	0.25		U J	TH
Thorium 230	14269-63-7	0.065	0.13	0.25	1.0	U	TH
Thorium 232	TH-232	0	0.065	0.25	1.0	U J	TH
Uranium 233/234	U-233/234	2.51	0.59	0.23	1.0		U
Uranium 235	15117-96-1	0.185	0.15	0.28	1.0	U	U
Uranium 238	U-238	1.35	0.44	0.23	1.0		U
Radium 226	13982-63-3	0.818	1.1	1.9	2.0	U	RA
Potassium 40	13966-00-2	U		290		U	GAM
Cobalt 60	10198-40-0	U		20	25	U	GAM
Cesium 137	10045-97-3	U		21	15	U	GAM
Radium 226	13982-63-3	U		33		U	GAM
Radium 228	15262-20-1	U		83		U	GAM
Europium 152	14683-23-9	U		57	50	U	GAM
Europium 154	15585-10-1	U		51	50	U	GAM
Europium 155	14391-16-3	U		45	50	U	GAM
Thorium 228	14274-82-9	U		28		U	GAM
Thorium 232	TH-232	U		83		U	GAM
Uranium 235	15117-96-1	U		63		U	GAM
Uranium 238	U-238	U		1900		U	GAM
Americium 241	14596-10-2	U		61		U	GAM
Ruthenium 106	13967-48-1	U		140		U	GAM
Antimony 125	14234-35-6	U		40		U	GAM
Beryllium 7	13966-02-4	U		160		UX	GAM
Cesium 134	13967-70-9	U		23		U	GAM

100Area&300AreaComponentRCBRAWaterSa

R 11/2/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/19/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0046 was composed of two water samples designated under SAF No. RC-048 with a Project Designation of: 100 Area and 300 Area Component of the RCBRA Water Sa.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on November 11 and 19, 2005.

2.0 ANALYSIS NOTES

2.1 Tritium Analysis

No problems were encountered during the course of the analyses.

2.2 Radium-226 Analysis

No problems were encountered during the course of the analyses.

2.3 Radium-228 Analysis

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.5 Isotopic Thorium Analysis

No problems were encountered during the course of the analyses.

2.6 Isotopic Uranium Analysis

No problems were encountered during the course of the analyses.

2.7 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Mel Mannion — 11/19/5

Melissa C. Mannion
Senior Program Manager

Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-3	Page 1 of 2

Collector: L.D. WALL	Company Contact: JOAN KESSNER; Telephone No.: 375-4688 K0046	Project Coordinator: KESSNER, JH	Price Code: 7L; Data Turnaround: 21 Days
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-H4-5 (7318)	SAF No.: RC-048	Air Quality ☐
Ice Chest No.: AFS-04-050	Field Logbook No.: EL-1592; COA: BESRAS6520	Method of Shipment: FED EX	
Shipped To: (EBERLINE SERVICES) LIONVILLE	Offsite Property No.: A060034	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

< DOT Limits

Special Handling and/or Storage

N/A

000015

SAMPLE ANALYSIS	Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	H2SO4 to pH <2 Cool 4C	Cool 4C	Cool 4C
	Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG
	No. of Container(s)	1	1	2	1	2	1	1	1	3	2
	Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	500mL	1000mL	1000mL
		~~Carbon-14~~; Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	NO2/NO3 - 353.2	Semi-VOA - 8270A (TCL)	PCBs - 8082
Sample No.	Matrix *	Sample Date	Sample Time								
J107Y9	WATER	10/13/05	1209	X	X	X	X	X	X		

CHAIN OF POSSESSION	Sign/Print Names		
		Received By/Stored In	Date/Time
Relinquished By/Removed From: FDH L.D. WALL & D Wall	Date/Time: 10/13/05 1220	SIGNATURE	10/13/05 1220
Relinquished By/Removed From: WCH SIGNATURE	Date/Time: 10/13/05 1330	Received By/Stored In: FEDEX	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time: 10/14/05	Received By/Stored In: FW	Date/Time: 10/14/05 10:00
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)

Matrix *

S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-6	Page 1 of 2
Collector: DURATEK L.D. WALL	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 7L; Data Turnaround: 21 Days
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-F5-6 K0046 (7318)	SAF No.: RC-048	Air Quality: ☐
Ice Chest No.: AFS-04-050	Field Logbook No.: EL-1592; COA: BESRAS 6520	Method of Shipment: FED EX	
Shipped To: EBERLINE SERVICES, LIONVILLE	Offsite Property No.: A060034	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

< DOT LIMITS

Special Handling and/or Storage

N/A

000016

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	H2SO4 to pH <2 Cool 4C	Cool 4C	Cool 4C
				Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG
				No. of Container(s)	1	1	2	1	2	1	1	1	3	2
				Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	500mL	1000mL	1000mL
					~~Carbon-14,~~ Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226, Ra-228	See item (2) in Special Instructions.	NO2/NO3 - 353.2	Semi-VOA - 8270A (TCL)	PCBs - 8082
J10891	WATER	10/13/05	1111		X	X	X	X	X	X				

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
L.D. WALL	10/13/05 1125	WCH S JOAKES	10/13/05 1125
WCH S JOAKES	10/13/05 1330	FED EX	
FED EX	10/14/05	FM	10/14/05 10:50

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)

Matrix *

S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RCBRA			DATA PACKAGE: K0046		
VALIDATOR: TLT		LAB: EB		DATE: 12/16/05	
			SDG: K0046		
ANALYSES PERFORMED					
Gross Alpha/Beta Total Uranium	Strontium-90 Radium-222 + 226	Technetium-99 Tritium	Alpha Spectroscopy	Gamma Spectroscopy	
SAMPLES/MATRIX					
J10891 J10799					
					water

1. Completeness ..... ☐ N/A

Technical verification forms present? ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

2. Initial Calibration (Levels D, E) ..... ☒ N/A

Instruments/detectors calibrated? ..... Yes No N/A

Initial calibration acceptable? ..... Yes No N/A

Standards NIST traceable? ..... Yes No N/A

Standards Expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

_____

_____

3. Continuing Calibration (Levels D, E) ☒ N/A

Calibration checked within required frequency? ..... Yes No N/A

Calibration check acceptable? ..... Yes No N/A

Calibration check standards traceable? ..... Yes No N/A

Calibration check standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

4. Background Counts (Levels D, E) ..... ☒ N/A

Background Counts checked within required frequency? ..... Yes No N/A

Background Counts acceptable? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

5. Blanks (Levels B, C, D, E) ..... ☐ N/A

Method blank analyzed within required frequency? ..... Yes No N/A

Method blank results acceptable? ..... Yes No N/A

Analytes detected in method blank? ..... Yes No N/A

Field blank(s) analyzed? ..... Yes No N/A

Field blank results acceptable? ..... Yes No N/A

Analytes detected in field blank(s)? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ..... ☐ N/A

LCS /BSS analyzed within required frequency? ..... 14 Yes No N/A

LCS/BSS recoveries acceptable? ..... Yes No N/A

LCS/BSS traceable? (Levels D,E) ..... Yes No N/A

LCS/BSS expired? (Levels D,E) ..... Yes No N/A

LCS/BSS levels correct? (Levels D,E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: no Th-228 or 232 LCS - Tell

7. Chemical Carrier Recovery (Levels C, D, E) ..... ☐ N/A

Chemical carrier added? ..... Yes No N/A

Chemical recovery acceptable? ..... Yes No N/A

Chemical carrier traceable? (Levels D, E) ..... Yes No N/A

Chemical carrier expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

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8. Tracer Recovery (Levels C, D, E) ..... ☐ N/A

Tracer added? ..... Yes No N/A

Tracer recovery acceptable? ..... Yes No N/A

Tracer traceable? (Levels D, E) ..... Yes No N/A

Tracer expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

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9. Matrix Spikes (Levels C, D, E) ..... ☐ N/A

Matrix spike analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Spike source traceable? (Levels D, E) ..... Yes No N/A

Spike source expired? Levels D, E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: _____

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10. Duplicates (Levels C, D, E) ..... ☐ N/A

Duplicates Analyzed at required frequency? ..... Yes No N/A

RPD Values Acceptable? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: _____

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11. Field QC Samples (Levels C, D E) ..... ☒ N/A

Field duplicate sample(s) analyzed? ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split sample(s) analyzed? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: _____

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12. Holding Times (All levels)

Are sample holding times acceptable? ..... Yes No N/A

Comments: _____

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_____

13. Results and Detection Limits (All Levels) ☐ N/A

Results reported for all required sample analyses?	(Yes)	No	N/A
Results supported in raw data?(Levels D, E)	Yes	No	(N/A)
Results Acceptable? (Levels D, E)	Yes	No	(N/A)
Transcription/Calculation errors? (Levels D, E)	Yes	No	(N/A)
MDA's meet required detection limits?	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments:_____

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Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0046

7318-004 Method Blank

METHOD BLANK

SDG 7318 Client/Case no Hanford SDG K0046
Contact Melissa C. Mannion Contract No. 630

Lab sample id R510084-04 Client sample id Method Blank
Dept sample id 7318-004 Material/Matrix WATER
SAF No RC-048

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	-185	980	1700	400	U	H
Total Strontium	SR-RAD	-0.170	0.32	0.71	2.0	U	SR
Radium 228	15262-20-1	-0.090	0.65	1.7	3.0	U	AC
Thorium 228	14274-82-9	0.022	0.044	0.17		U	TH
Thorium 230	14269-63-7	-0.022	0.088	0.17	1.0	U	TH
Thorium 232	TH-232	0	0.044	0.17	1.0	U	TH
Uranium 233/234	U-233/234	0.033	0.066	0.25	1.0	U	U
Uranium 235	15117-96-1	0	0.080	0.31	1.0	U	U
Uranium 238	U-238	0	0.066	0.25	1.0	U	U
Radium 226	13982-63-3	0.376	0.99	1.8	2.0	U	RA
Potassium 40	13966-00-2	U		170		U	GAM
Cobalt 60	10198-40-0	U		19	25	U	GAM
Cesium 137	10045-97-3	U		14	15	U	GAM
Radium 226	13982-63-3	U		27		U	GAM
Radium 228	15262-20-1	U		66		U	GAM
Europium 152	14683-23-9	U		37	50	U	GAM
Europium 154	15585-10-1	U		48	50	U	GAM
Europium 155	14391-16-3	U		26	50	U	GAM
Thorium 228	14274-82-9	U		18		U	GAM
Thorium 232	TH-232	U		66		U	GAM
Uranium 235	15117-96-1	U		47		U	GAM
Uranium 238	U-238	U		1900		U	GAM
Americium 241	14596-10-2	U		15		U	GAM
Ruthenium 106	13967-48-1	U		120		U	GAM
Antimony 125	14234-35-6	U		34		U	GAM
Beryllium 7	13966-02-4	U		110		UX	GAM
Cesium 134	13967-70-9	U		19		U	GAM

100Area&300AreaComponentRCBRAWaterSa

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 11/19/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0046

7318-003

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7318 | Client/Case no Hanford | SDG K0046

Contact Melissa C. Mannion | Contract No. 630

Lab sample id R510084-03 | Client sample id Lab Control Sample

Dept sample id 7318-003 | Material/Matrix WATER

SAF No RC-048

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	21400	1500	1600	400		H	22700	910	94	82-118	80-120
Total Strontium	21.3	1.2	0.56	2.0		SR	19.8	0.79	108	81-119	80-120
Radium 228	18.8	1.5	1.9	3.0		AC	17.4	0.70	108	84-116	80-120
Thorium 230	21.6	2.5	0.17	1.0		TH	21.0	0.84	103	80-120	80-120
Uranium 233/234	20.3	2.3	1.0	1.0		U	18.6	0.74	109	79-121	80-120
Uranium 235	15.7	1.9	0.27	1.0		U	15.1	0.60	104	79-121	80-120
Uranium 238	19.4	2.2	0.98	1.0		U	20.2	0.81	96	81-119	80-120
Radium 226	239	9.3	1.8	2.0		RA	280	11	85	90-110	80-120
Cobalt 60	413	71	47	25		GAM	444	18	93	68-132	80-120
Cesium 137	487	61	46	15		GAM	438	18	111	67-133	80-120

100Area&300AreaComponentRCBRAWaterSa

QC-LCS 54735

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 11/19/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0046

7318-005 J107Y9

DUPLICATE

SDG 7318 Client/Case no Hanford SDG K0046

Contact Melissa C. Mannion Contract No. 630

DUPLICATE	ORIGINAL	
Lab sample id R510084-05	Lab sample id R510084-01	Client sample id J107Y9
Dept sample id 7318-005	Dept sample id 7318-001	Location/Matrix 199-H4-5 WATER
	Received 10/14/05	Collected/Volume 10/13/05 12:09 7.0 L
		Custody/SAF No RC-048-3 RC-048

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI-FIERS	RPD %	3σ TOT	DER σ
Tritium	2980	170	170	400		H	2900	170	170		3	25	0.3
Total Strontium	0.117	0.39	0.78	2.0	U	SR	-0.176	0.30	0.65	U	-		1.2
Radium 228	0.742	0.82	2.0	3.0	U	AC	-0.185	0.73	2.0	U	-		1.7
Thorium 228	0	0.074	0.28		U	TH	0.066	0.066	0.25	U	-		1.3
Thorium 230	-0.037	0.074	0.28	1.0	U	TH	0.065	0.13	0.25	U	-		1.4
Thorium 232	0	0.074	0.28	1.0	U	TH	0	0.065	0.25	U	-		0
Uranium 233/234	2.17	0.56	0.22	1.0		U	2.51	0.59	0.23		15	53	0.8
Uranium 235	0.142	0.14	0.27	1.0	U	U	0.185	0.15	0.28	U	-		0.4
Uranium 238	1.61	0.43	0.22	1.0		U	1.35	0.44	0.23		18	63	0.8
Radium 226	-0.357	0.95	1.9	2.0	U	RA	0.818	1.1	1.9	U	-		1.6
Potassium 40	U		170		U	GAM	U		290	U	-		0.7
Cobalt 60	U		17	25	U	GAM	U		20	U	-		0.2
Cesium 137	U		14	15	U	GAM	U		21	U	-		0.5
Radium 226	U		25		U	GAM	U		33	U	-		0.4
Radium 228	U		59		U	GAM	U		83	U	-		0.5
Europium 152	U		34	50	U	GAM	U		57	U	-		0.7
Europium 154	U		43	50	U	GAM	U		51	U	-		0.2
Europium 155	U		24	50	U	GAM	U		45	U	-		0.8
Thorium 228	U		16		U	GAM	U		28	U	-		0.7
Thorium 232	U		59		U	GAM	U		83	U	-		0.5
Uranium 235	U		41		U	GAM	U		63	U	-		0.6
Uranium 238	U		1800		U	GAM	U		1900	U	-		0.1
Americium 241	U		14		U	GAM	U		61	U	-		1.5
Ruthenium 106	U		130		U	GAM	U		140	U	-		0.1
Antimony 125	U		31		U	GAM	U		40	U	-		0.4
Beryllium 7	U		120		UX	GAM	U		160	UX	-		0.4
Cesium 134	U		18		U	GAM	U		23	U	-		0.3

100Area&300AreaComponentRCBRAWaterSa

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 11/19/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0046

7318-006 J10891

MATRIX SPIKE

SDG 7318 Client/Case no Hanford SDG K0046

Contact Melissa C. Mannion Contract No. 630

MATRIX SPIKE	ORIGINAL	
Lab sample id R510084-06	Lab sample id R510084-02	Client sample id J10891
Dept sample id 7318-006	Dept sample id 7318-002	Location/Matrix 199-F5-6 WATER
	Received 10/14/05	Collected/Volume 10/13/05 11:11 7.0 L
		Custody/SAF No RC-048-6 RC-048

ANALYTE	SPIKE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	ORIGINAL pCi/L	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	24200	520	220	400	X	H	22700	910	1970	150	98	82-118	60-140

100Area&300AreaComponentRCBRAWaterSa

QC-MS#2 54738

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-MS
Version 3.06
Report date 11/19/05

Date: 3 January 2005
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 Area and 300 Area Component of the RCBRA Water Sampling
Subject: Inorganics - Data Package No. K0046-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0046 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date*
J10891	10/13/05	Water	C	See note 1
J107Y9	10/13/05	Water	C	See note 1

1 - ICP metals (6010B) and mercury (7471A).

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Water Sampling Plan (DOE/RL-2005, Rev. 0, October 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for mercury and 6 months for ICP metals.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed

through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

Due to method blank contamination, the lithium and zinc results in sample J10891 were qualified as an estimate and flagged "UJ".

Due to method blank contamination, the manganese result in sample J107Y9 was qualified as an estimate and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data . The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 80% to 120%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 79% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 120% or less than 80% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 120% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 20%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD outside QC limits (22%), all phosphorous results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 and 300 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

- **Completeness**

Data package No. K0046 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to method blank contamination, the lithium and zinc results in sample J10891 were qualified as an estimate and flagged "UJ". Due to method blank contamination, the manganese result in sample J107Y9 was qualified as an estimate and flagged "UJ". Due to an RPD outside QC limits (22%), all phosphorous results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-2005, Rev. 0, October 2005, *100 Area and 300 Area Component of the RCBRA Water Sampling Plan*.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

METALS DATA QUALIFICATION SUMMARY*

SDG: K0026	REVIEWER: TLI	Project: RCBRA	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Lithium Zinc	UJ	J10891	Blank contamination
Manganese	UJ	J107Y9	Blank contamination
Phosphorous	J	All	RPD

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD					
Laboratory: LLI	SDG: K0046				
Sample Number		J10891		J107Y9	
Remarks					
Sample Date		10/13/05		10/13/05	
Inorganics	RQL	Result	Q	Result	Q
Silver	10	0.80	U	0.80	U
Aluminum	50	31.9	U	31.9	U
Arsenic	100	4.7	U	4.7	U
Boron		48.3		44.6	
Barium	20	42.5		68.5	
Beryllium	5	0.10	U	0.10	U
Bismuth		6.5	U	6.5	U
Calcium		78700		69300	
Cadmium	5	0.40	U	0.40	U
Cobalt		0.70	U	0.70	U
Chromium	10	80.1		19.5	
Copper	10	1.3	U	1.3	U
Iron	50	220		133	
Mercury	0.5	0.10	U	0.10	U
Potassium		2700		5700	
Lithium		2.6	UJ	4.9	
Magnesium		11400		12600	
Manganese	5	9.2		1.1	UJ
Molybdenum		1.8	U	1.8	U
Sodium		11200		21500	
Nickel	40	1.3	U	2.4	
Phosphorous		19.4	J	26.6	J
Lead	50	2.9	U	2.9	U
Antimony		3.0	U	3.0	U
Selenium		4.3	U	4.3	U
Silicon		11300		15200	
Tin	100	5.1	U	5.1	U
Strontium		361		337	
Thallium		7.3	U	7.3	U
Uranium	3000	15.2		13.7	U
Vanadium	25	1.2		4.2	
Zinc	10	1.6	UJ	5.0	

0000740

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/21/05

CLIENT: TNUHANFORD RC-048 K0046 LVL LOT #: 0510L496

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10891	Silver, Total	0.80	u	UG/L	0.80	1.0
		Aluminum, Total	31.9	u	UG/L	31.9	1.0
		Arsenic, Total	4.7	u	UG/L	4.7	1.0
		Boron, Total	48.3		UG/L	2.3	1.0
		Barium, Total	42.5		UG/L	0.10	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Bismuth, Total	6.5	u	UG/L	6.5	1.0
		Calcium, Total	78700		UG/L	7.1	1.0
		Cadmium, Total	0.40	u	UG/L	0.40	1.0
		Cobalt, Total	0.70	u	UG/L	0.70	1.0
		Chromium, Total	80.1		UG/L	0.70	1.0
		Copper, Total	1.3	u	UG/L	1.3	1.0
		Iron, Total	220		UG/L	26.0	1.0
		Mercury, Total	0.10	u	UG/L	0.10	1.0
		Potassium, Total	2700		UG/L	340	1.0
		Lithium, Total	2.6	UJ	UG/L	0.30	1.0
		Magnesium, Total	11400		UG/L	6.5	1.0
		Manganese, Total	9.2		UG/L	0.20	1.0
		Molybdenum, Total	1.8	u	UG/L	1.8	1.0
		Sodium, Total	11200		UG/L	17.4	1.0
		Nickel, Total	1.3	u	UG/L	1.3	1.0
		Phosphorus, Total	19.4	J	UG/L	8.4	1.0
		Lead, Total	2.9	u	UG/L	2.9	1.0
		Antimony, Total	3.0	u	UG/L	3.0	1.0
		Selenium, Total	4.3	u	UG/L	4.3	1.0
		Silicon, Total	11300		UG/L	17.8	1.0
		Tin, Total	5.1	u	UG/L	5.1	1.0
		Strontium, Total	361		UG/L	0.10	1.0
		Thallium, Total	7.3	u	UG/L	7.3	1.0
		Uranium, Total	15.2		UG/L	13.7	1.0
		Vanadium, Total	1.2		UG/L	0.60	1.0
		Zinc, Total	1.6	UJ	UG/L	0.70	1.0

1/3/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/21/05

CLIENT: TNUHANFORD RC-048 K0046 LVL LOT #: 0510L496

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J107Y9	Silver, Total	0.80 u	UG/L	0.80	1.0
		Aluminum, Total	31.9 u	UG/L	31.9	1.0
		Arsenic, Total	4.7 u	UG/L	4.7	1.0
		Boron, Total	44.6	UG/L	2.3	1.0
		Barium, Total	68.5	UG/L	0.10	1.0
		Beryllium, Total	0.10 u	UG/L	0.10	1.0
		Bismuth, Total	6.5 u	UG/L	6.5	1.0
		Calcium, Total	69300	UG/L	7.1	1.0
		Cadmium, Total	0.40 u	UG/L	0.40	1.0
		Cobalt, Total	0.70 u	UG/L	0.70	1.0
		Chromium, Total	19.5	UG/L	0.70	1.0
		Copper, Total	1.3 u	UG/L	1.3	1.0
		Iron, Total	133	UG/L	26.0	1.0
		Mercury, Total	0.10 u	UG/L	0.10	1.0
		Potassium, Total	5700	UG/L	340	1.0
		Lithium, Total	4.9	UG/L	0.30	1.0
		Magnesium, Total	12600	UG/L	6.5	1.0
		Manganese, Total	1.1 UJ	UG/L	0.20	1.0
		Molybdenum, Total	1.8 u	UG/L	1.8	1.0
		Sodium, Total	21500	UG/L	17.4	1.0
		Nickel, Total	2.4	UG/L	1.3	1.0
		Phosphorus, Total	26.6 J	UG/L	8.4	1.0
		Lead, Total	2.9 u	UG/L	2.9	1.0
		Antimony, Total	3.0 u	UG/L	3.0	1.0
		Selenium, Total	4.3 u	UG/L	4.3	1.0
		Silicon, Total	15200	UG/L	17.8	1.0
		Tin, Total	5.1 u	UG/L	5.1	1.0
		Strontium, Total	337	UG/L	0.10	1.0
		Thallium, Total	7.3 u	UG/L	7.3	1.0
		Uranium, Total	13.7 u	UG/L	13.7	1.0
		Vanadium, Total	4.2	UG/L	0.60	1.0
		Zinc, Total	5.0	UG/L	0.70	1.0

R 1/3/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-048
LVL#: 0510L496
SDG/SAF#: K0046/RC-048

W.O.#: 11343-606-001-9999-00
Date Received: 10-14-05

METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 water samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. The samples were rerun for Potassium, Sodium, and Phosphorous due to high concentrations or sample matrix.

3. All analyses were performed within the required holding times.

4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. The duplicate analyses for 7 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

(IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

13. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

10/27/08
Date

jjw/m10-496

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-6	Page 1 of 2
Collector: DURATEK L.D. WALL	Company Contact: JOAN KESSNER; Telephone No. 375-4688	Project Coordinator: KESSNER, JH	Price Code 7L; Data Turnaround: 21 Days
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-F5-6	SAF No. RC-048	Air Quality ☐
Ice Chest No. ERC-99-051 AND ERC-03-102	Field Logbook No. EL-1592; COA BESRAS6520	Method of Shipment: FED EX	
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No. A060050	Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

< DOT Limits

Special Handling and/or Storage

~~N/A~~ COOL 4°C DAS 10/13/05

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	H2SO4 to pH <2 Cool 4C	Cool 4C	Cool 4C
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	1	3	2
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	500mL	1000mL	1000mL
SAMPLE ANALYSIS	Carbon-14; Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium-226; Ra-228	See item (2) in Special Instructions.	NO2/NO3 - 353.2	Semi-VOA - 8270A (TCL)	PCBs - 8082

Sample No.	Matrix *	Sample Date	Sample Time										
J10891	WATER	10/13/05	1111							X	X	X	X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
L.D. WALL FDH [signature]	10/13/05 1125	SJGALE WCH [signature]	101305 1125
SJGALE WCH [signature]	101305 1330	FED EX	
Fed Ex	10/14/05 0910	V. Kennedy [signature]	10/14/05 0910

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)

Matrix *

S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

0000016

0000002

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-3	Page 1 of 2

Collector: L.D. WALL	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 7L; Data Turnaround: 21 Days
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-H4-5	SAF No.: RC-048	Air Quality ☐
Ice Chest No.: ERC-99-056 AND ERC-03-102	Field Logbook No.: EL-1592; COA: BESRAS6520	Method of Shipment: FED EX	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A060050	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

< DOT Limits

Special Handling and/or Storage

~~N/A~~

COOL 4°C DAS 10/13/05

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	H2SO4 to pH <2 Cool 4C	Cool 4C	Cool 4C
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	1	3	2
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	500mL	1000mL	1000mL
SAMPLE ANALYSIS	Carbon-14; Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	NO2/NO3 - 353.2	Semi-VOA - 8270A (TCL)	PCBs - 8082

Sample No.	Matrix *	Sample Date	Sample Time										
J107Y9	WATER	10/13/05	1209							X	X	X	X

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: FPT L.D. WALL [signature]	10/13/05 1220	Received By/Stored In: WCH S.JOALE [signature]	10/13/05 1220
Relinquished By/Removed From: WCH S.JOALE [signature]	10/13/05 1330	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FedEx	10/14/05 0910	Received By/Stored In: [signature]	10/14/05 0910
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)

Matrix *

S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

000017

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RCBRA			DATA PACKAGE: K0046		
VALIDATOR: TCT		LAB: LCT		DATE: 12/16/05	
			SDG: K0046		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J10891 J10749					
				Water	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

ICP interference checks acceptable? ..... Yes No N/A

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No (N/A)
ICB and CCB results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... Yes (No) N/A
Field blanks analyzed? (Levels C, D, E) ..... Yes (No) N/A
Field blank results acceptable? (Levels C, D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: Lithium - 91 - UJ n: FB
Manganese - 49 - UJ
Zinc - 91 - UJ

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD results acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... (Yes) No N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes (No) N/A
Performance audit sample results acceptable? ..... Yes No (N/A)

Comments: no Pats

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable?	Yes	(No)	N/A
Duplicate results acceptable?	Yes	(No)	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	(N/A)
MS/MSD standards expired? (Levels D, E)	Yes	No	(N/A)
Field duplicate RPD values acceptable?	Yes	No	(N/A)
Field split RPD values acceptable?	Yes	No	(N/A)
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments: phosphorous 22% - J all

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed?	Yes	No	(N/A)
ICP serial dilution %D values acceptable?	Yes	No	(N/A)
ICP post digestion spike required?	Yes	No	(N/A)
ICP post digestion spike values acceptable?	Yes	No	(N/A)
Standards traceable?	Yes	No	(N/A)
Standards expired?	Yes	No	(N/A)
Transcription/calculation errors?	Yes	No	(N/A)

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required? ..... Yes No N/A
Duplicate injection %RSD values acceptable? ..... Yes No N/A
Analytical spikes performed as required? ..... Yes No N/A
Analytical spike recoveries acceptable? ..... Yes No N/A
Standards traceable? ..... Yes No N/A
Standards expired? ..... Yes No N/A
MSA performed as required? ..... Yes No N/A
MSA results acceptable? ..... Yes No N/A
Transcription/calculation errors? ..... Yes No N/A

Comments: _____

8. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A
Sample holding times acceptable? ..... Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... (Yes) No N/A

Rresults supported in the raw data? (Levels D, E) ..... Yes No (N/A)

Samples properly prepared? (Levels D, E) ..... Yes No (N/A)

Detection limits meet RDL? ..... (Yes) No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: _____

_____

_____

_____

_____

_____

_____

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/21/05

CLIENT: TNUHANFORD RC-048 K0046 LVL LOT #: 0510L496

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	05L0598-MB1	Silver, Total	0.80	u	UG/L	0.80	1.0
		Aluminum, Total	31.9	u	UG/L	31.9	1.0
		Arsenic, Total	4.7	u	UG/L	4.7	1.0
		Boron, Total	2.3		UG/L	2.3	1.0
		Barium, Total	0.10	u	UG/L	0.10	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Bismuth, Total	6.5	u	UG/L	6.5	1.0
		Calcium, Total	25.9		UG/L	7.1	1.0
		Cadmium, Total	0.40	u	UG/L	0.40	1.0
		Cobalt, Total	0.70	u	UG/L	0.70	1.0
		Chromium, Total	0.70	u	UG/L	0.70	1.0
		Copper, Total	1.3	u	UG/L	1.3	1.0
		Iron, Total	26.0	u	UG/L	26.0	1.0
		Potassium, Total	340	u	UG/L	340	1.0
		Lithium, Total	0.57		UG/L	0.30	1.0
		Magnesium, Total	12.1		UG/L	6.5	1.0
		Manganese, Total	0.34		UG/L	0.20	1.0
		Molybdenum, Total	1.8	u	UG/L	1.8	1.0
		Sodium, Total	17.4	u	UG/L	17.4	1.0
		Nickel, Total	1.3	u	UG/L	1.3	1.0
		Phosphorus, Total	8.4	u	UG/L	8.4	1.0
		Lead, Total	2.9	u	UG/L	2.9	1.0
		Antimony, Total	3.0	u	UG/L	3.0	1.0
		Selenium, Total	4.3	u	UG/L	4.3	1.0
		Silicon, Total	17.8	u	UG/L	17.8	1.0
		Tin, Total	5.1	u	UG/L	5.1	1.0
		Strontium, Total	0.17		UG/L	0.10	1.0
		Thallium, Total	7.3	u	UG/L	7.3	1.0
		Uranium, Total	13.7	u	UG/L	13.7	1.0
		Vanadium, Total	0.60	u	UG/L	0.60	1.0
		Zinc, Total	0.71		UG/L	0.70	1.0
BLANK1	05C0252-MB1	Mercury, Total	0.10	u	UG/L	0.10	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 10/21/05

CLIENT: TNUHANFORD RC-048 K0046 LVL LOT #: 0510L496

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J10891	Silver, Total	47.6	0.80u	50.0	95.2	1.0
		Aluminum, Total	1960	31.9 u	2000	98.0	1.0
		Arsenic, Total	1920	4.7 u	2000	96.0	1.0
		Boron, Total	1000	48.3	1000	95.2	1.0
		Barium, Total	1960	42.5	2000	95.8	1.0
		Beryllium, Total	48.4	0.10u	50.0	96.8	1.0
		Bismuth, Total	4710	6.5 u	5000	94.2	1.0
		Calcium, Total	101000	78700	25000	89.3	1.0
		Cadmium, Total	46.7	0.40u	50.0	93.4	1.0
		Cobalt, Total	470	0.70u	500	93.9	1.0
		Chromium, Total	270	80.1	200	94.8	1.0
		Copper, Total	242	1.3 u	250	96.7	1.0
		Iron, Total	1170	220	1000	95.3	1.0
		Potassium, Total	28000	2700	25000	101.3	1.0
		Lithium, Total	1040	2.6	1000	103.4	1.0
		Magnesium, Total	34800	11400	25000	93.3	1.0
		Manganese, Total	499	9.2	500	97.9	1.0
		Molybdenum, Total	946	1.8 u	1000	94.6	1.0
		Sodium, Total	35500	11200	25000	97.3	1.0
		Nickel, Total	471	1.3 u	500	94.2	1.0
		Phosphorus, Total	5110	19.4	5000	101.9	1.0
		Lead, Total	475	2.9 u	500	95.0	1.0
		Antimony, Total	480	3.0 u	500	95.9	1.0
		Selenium, Total	1970	4.3 u	2000	98.5	1.0
		Silicon, Total	12200	11300	1000	87.2*	1.0
		Tin, Total	956	5.1 u	1000	95.6	1.0
		Strontium, Total	1300	361	1000	94.1	1.0
		Thallium, Total	1930	7.3 u	2000	96.4	1.0
		Uranium, Total	2380	15.2	2500	94.8	1.0
		Vanadium, Total	479	1.2	500	95.6	1.0
		Zinc, Total	477	1.6	500	95.1	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 10/21/05

CLIENT: TNUHANFORD RC-048 K0046 LVL LOT #: 0510L496

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J107Y9	Mercury, Total	1.1	0.10u	1.0	107.2	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 10/21/05

CLIENT: TNUHANFORD RC-048 K0046 LVL LOT #: 0510L496

WORK ORDER: 11243-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J10891	Silver, Total	0.80u	0.80u	NC	1.0
		Aluminum, Total	31.9 u	31.9 u	NC	1.0
		Arsenic, Total	4.7 u	4.7 u	NC	1.0
		Boron, Total	48.3	42.2	13.5	1.0
		Barium, Total	42.5	41.7	1.9	1.0
		Beryllium, Total	0.10u	0.10u	NC	1.0
		Bismuth, Total	6.5 u	6.5 u	NC	1.0
		Calcium, Total	78700	77400	1.7	1.0
		Cadmium, Total	0.40u	0.40u	NC	1.0
		Cobalt, Total	0.70u	0.70u	NC	1.0
		Chromium, Total	80.1	78.7	1.8	1.0
		Copper, Total	1.3 u	1.3 u	NC	1.0
		Iron, Total	220	217	1.6	1.0
		Potassium, Total	2700	3420	23.3	1.0
		Lithium, Total	2.6	2.1	21.3	1.0
		Magnesium, Total	11400	11300	1.3	1.0
		Manganese, Total	9.2	9.0	2.2	1.0
		Molybdenum, Total	1.8 u	1.8 u	NC	1.0
		Sodium, Total	11200	11100	0.41	1.0
		Nickel, Total	1.3 u	1.3 u	NC	1.0
		Phosphorus, Total	19.4	24.2	22.0	1.0
		Lead, Total	2.9 u	2.9 u	NC	1.0
		Antimony, Total	3.0 u	3.0 u	NC	1.0
		Selenium, Total	4.3 u	5.0	~~NC~~ 200 MW 10/25/05	1.0
		Silicon, Total	11300	11200	1.1	1.0
		Tin, Total	5.1 u	5.1 u	NC	1.0
		Strontium, Total	361	356	1.4	1.0
		Thallium, Total	7.3 u	7.3 u	NC	1.0
		Uranium, Total	15.2	13.7 u	~~NC~~ 200 MW 10/25/05	1.0
		Vanadium, Total	1.2	0.96	22.2	1.0
		Zinc, Total	1.6	2.2	31.6	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 10/21/05

CLIENT: TNUHANFORD RC-048 K0046 LVL LOT #: 0510L496

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-002REP	J107Y9	Mercury, Total	0.10u	0.10u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 10/21/05

CLIENT: TNUHANFORD RC-048 K0046 LVL LOT #: 0510L496

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	05L0598-LC1	Silver, LCS	488	500	UG/L	97.6
		Aluminum, LCS	4850	5000	UG/L	97.1
		Arsenic, LCS	9550	10000	UG/L	95.5
		Boron, LCS	4810	5000	UG/L	96.2
		Barium, LCS	4800	5000	UG/L	96.1
		Beryllium, LCS	240	250	UG/L	96.1
		Bismuth, LCS	4820	5000	UG/L	96.3
		Calcium, LCS	24100	25000	UG/L	96.3
		Cadmium, LCS	239	250	UG/L	95.5
		Cobalt, LCS	2410	2500	UG/L	96.5
		Chromium, LCS	484	500	UG/L	96.7
		Copper, LCS	1200	1250	UG/L	96.2
		Iron, LCS	4820	5000	UG/L	96.4
		Potassium, LCS	24200	25000	UG/L	96.6
		Lithium, LCS	5090	5000	UG/L	101.9
		Magnesium, LCS	24000	25000	UG/L	95.8
		Manganese, LCS	742	750	UG/L	98.9
		Molybdenum, LCS	4800	5000	UG/L	95.9
		Sodium, LCS	24100	25000	UG/L	96.5
		Nickel, LCS	1910	2000	UG/L	95.5
		Phosphorus, LCS	4890	5000	UG/L	97.7
		Lead, LCS	2400	2500	UG/L	96.0
		Antimony, LCS	2890	3000	UG/L	96.2
		Selenium, LCS	9820	10000	UG/L	98.2
		Silicon, LCS	4710	5000	UG/L	94.2
		Tin, LCS	4820	5000	UG/L	96.4
		Strontium, LCS	4850	5000	UG/L	96.9
		Thallium, LCS	9700	10000	UG/L	97.0
		Uranium, LCS	2380	2500	UG/L	95.4
		Vanadium, LCS	2410	2500	UG/L	96.4
		Zinc, LCS	962	1000	UG/L	96.2
LCS1	05C0252-LC1	Mercury, LCS	5.1	5.0	UG/L	101.1

Date: 3 January 2006
To: Washington Closure Hanford (technical representative)
From: TechLaw, Inc.
Project: 100 Area and 300 Area Component of the RCBRA Water Sampling
Subject: Semivolatile - Data Package No. K0046-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0046 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Note
J10891	10/13/05	Water	C	See note 1
J107Y9	10/13/05	Water	C	See note 1

1 – Semivolatiles by 8270C.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Water Sampling Plan (DOE/RL-2005, Rev. 0, October 2005). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

- **Method Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

Due to method blank contamination, the bis(2-ethylhexyl)phthalate result in sample J10891 was qualified as undetected, raised to the RQL and flagged "U".

All other method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to matrix spike and matrix spike duplicate recoveries outside QC limits (4% and 1%), all 4-chloroanaline results were qualified as estimates and flagged "J".

Due to matrix spike and matrix spike duplicate recoveries outside QC limits (7% and 2%), all 4-nitroanaline results were qualified as estimates and flagged "J".

Due to a matrix spike duplicate recovery outside QC limits (9%), all n-nitrosodiphenylamine results were qualified as estimates and flagged "J".

Due to matrix spike (0%), matrix spike duplicate (0%) and LCS (4%) recoveries outside QC limits, all 3,3-dichlorodibenzidine results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-20%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to an RPD outside QC limits (34%), all bis(2-chloroethoxy)methane results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (120%), all 4-chloroanaline results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (35%), all 2-nitroanaline results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (35%), all 3-nitroanaline results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (111%), all 4-nitroanaline results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (123%), all n-nitrosodiphenylamine results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (91%), all carbazole results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (65%), all di-n-octylphthalate results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (58%), all benzo(b)fluoranthene results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (58%), all benzo(k)fluoranthene results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (42%), all benzo(a)pyrene results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (47%), all ideno(1,2,3-cd)pyrene results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (53%), all dibenz(a,h)anthracene results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (41%), all benzo(g,h,i)perylene results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

· **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

· **Completeness**

Data package No. K0046-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the bis(2-ethylhexyl)phthalate result in sample J10891 was qualified as undetected, raised to the RQL and flagged "U".

- Due to matrix spike and matrix spike duplicate recoveries outside QC limits (4% and 1%), all 4-chloroanaline results were qualified as estimates and flagged "J".

- Due to matrix spike and matrix spike duplicate recoveries outside QC limits (7% and 2%), all 4-nitroanaline results were qualified as estimates and flagged "J".

- Due to a matrix spike duplicate recovery outside QC limits (9%), all n-nitrosodiphenylamine results were qualified as estimates and flagged "J".

- Due to matrix spike (0%), matrix spike duplicate (0%) and LCS (4%) recoveries outside QC limits, all 3,3-dichlorodibenzidine results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (34%), all bis(2-chloroethoxy)methane results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (120%), all 4-chloroanaline results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (35%), all 2-nitroanaline results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (35%), all 3-nitroanaline results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (111%), all 4-nitroanaline results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (123%), all n-nitrosodiphenylamine results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (91%), all carbazole results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (65%), all di-n-octylphthalate results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (58%), all benzo(b)fluoranthene results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (58%), all benzo(k)fluoranthene results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (42%), all benzo(a)pyrene results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (47%), all ideno(1,2,3-cd)pyrene results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (53%), all dibenz(a,h)anthracene results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (41%), all benzo(g,h,i)perylene results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-2005, Rev. 0, October 2005, *100 Area and 300 Area Component of the RCBRA Water Sampling Plan*.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: K0046	REVIEWER: TLI Project: JBCBRA	PAGE: 1 OF 1
COMMENTS:		

COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bis(2-ethylhexyl)phthalate	U at RQL	J10891	Blank contamination
4-chloroanaline 4-nitroanaline	J	All	MS/MSD recovery
3,3-dichlorobenzidine	J	All	MS, MSD & LCS recovery
n-nitrosodiphenylamine	J	All	MSD recovery
bis(2-chloroethoxy)methane 4-chloroanaline 2-nitroanaline 3-nitroanaline 4-nitroanaline n-nitrosodiphenylamine carbazole di-n-octylphthalate benzo(b)fluoranthene benzo(k)fluoranthene benzo(a)pyrene ideno(1,2,3-cd)pyrene dibenz(a,h)anthracene benzo(g,h,i)perylene	J	All	RPD

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE ANALYSIS, WATER MATRIX, (UG/L)

Project: WASHINGTON CLOSURE HANFORD					
Laboratory: LLI	SDG: K0046				
Sample Number		J10891		J107Y9	
Remarks					
Sample Date		10/13/05		10/13/05	
Extraction Date		10/17/05		10/17/05	
Analysis Date		10/19/05		10/19/05	
Semivolatile (8270C)	RQL	Result	Q	Result	Q
Phenol	50	10	U	10	U
bis(2-Chloroethyl)ether	50	10	U	10	U
2-Chlorophenol	50	10	U	10	U
1,3-Dichlorobenzene	50	10	U	10	U
1,4-Dichlorobenzene	50	10	U	10	U
1,2-Dichlorobenzene	50	10	U	10	U
2-Methylphenol	50	10	U	10	U
2,2'-oxybis(1-chloropropane)	50	10	U	10	U
3 and/or 4-Methylphenol	50	10	U	10	U
N-Nitroso-di-n-propylamine	50	10	U	10	U
Hexachloroethane	50	10	U	10	U
Nitrobenzene	50	10	U	10	U
Isophorone	50	10	U	10	U
2-Nitrophenol	50	10	U	10	U
2,4-Dimethylphenol	50	10	U	10	U
bis(2-Chloroethoxy)methane	50	10	UJ	10	UJ
2,4-Dichlorophenol	50	10	U	10	U
1,2,4-Trichlorobenzene	50	10	U	10	U
Naphthalene	50	10	U	10	U
4-Chloroaniline	50	10	UJ	10	UJ
Hexachlorobutadiene	50	10	U	10	U
4-Chloro-3-methylphenol	50	10	U	10	U
2-Methylnaphthalene	50	10	U	10	U
Hexachlorocyclopentadiene	50	10	U	10	U
2,4,6-Trichlorophenol	50	10	U	10	U
2,4,5-Trichlorophenol*	50	25	U	25	U
2-Chloronaphthalene	50	10	U	10	U
2-Nitroaniline*	50	25	UJ	25	UJ
Dimethylphthalate	50	10	U	10	U
Acenaphthylene	50	10	U	10	U
2,6-Dinitrotoluene	50	10	U	10	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

SEMIVOLATILE ANALYSIS, WATER MATRIX, (UG/L)

Project: WASHINGTON CLOSURE HANFORD					
Laboratory: LLI	SDG: K0046				
Sample Number		J10891		J107Y9	
Remarks					
Sample Date		10/13/05		10/13/05	
Extraction Date		10/17/05		10/17/05	
Analysis Date		10/19/05		10/19/05	
Semivolatile (8270C)	RQL	Result	Q	Result	Q
3-Nitroaniline*	50	25	UJ	25	UJ
Acenaphthene	50	10	U	10	U
2,4-Dinitrophenol*	50	25	U	25	U
4-Nitrophenol*	50	25	U	25	U
Dibenzofuran	50	10	U	10	U
2,4-Dinitrotoluene	50	10	U	10	U
Diethylphthalate	50	10	U	10	U
4-Chlorophenyl-phenyl ether	50	10	U	10	U
Fluorene	50	10	U	10	U
4-Nitroaniline*	50	25	UJ	25	UJ
4,6-Dinitro-2-methylphenol*	50	25	U	25	U
N-Nitrosodiphenylamine	50	10	UJ	10	UJ
4-Bromophenyl-phenyl ether	50	10	U	10	U
Hexachlorobenzene	50	10	U	10	U
Pentachlorophenol*	50	25	U	25	U
Phenanthrene	50	10	U	10	U
Anthracene	50	10	U	10	U
Carbazole	50	10	UJ	10	UJ
Di-n-butylphthalate	50	10	U	10	U
Fluoranthene	50	10	U	10	U
Pyrene	50	10	U	10	U
Butylbenzylphthalate	50	10	U	10	U
3,3'-Dichlorobenzidine	50	10	UJ	10	UJ
Benzo(a)anthracene	50	10	U	10	U
Chrysene	50	10	U	10	U
bis(2-Ethylhexyl)phthalate	50	50	U	10	U
Di-n-octylphthalate	50	10	UJ	10	UJ
Benzo(b)fluoranthene	50	10	UJ	10	UJ
Benzo(k)fluoranthene	50	10	UJ	10	UJ
Benzo(a)pyrene	50	10	UJ	10	UJ
Indeno(1,2,3-cd)pyrene	50	10	UJ	10	UJ
Dibenz(a,h)anthracene	50	10	UJ	10	UJ
Benzo(g,h,i)perylene	50	10	UJ	10	UJ

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 10/27/05 11:58

RFW Batch Number: 0510L496 Client: TNUHANFORD RC-048 K0046 Work Order: 11343606001 Page: 1a

	Cust ID:	J10891	J10891	J10891	J107Y9	SBLKPJ	SBLKPJ BS
Sample Information	RFW#:	001	001 MS	001 MSD	002	05LE0823-MB1	05LE0823-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Surrogate Recovery	Nitrobenzene-d5	57 %	66 %	65 %	61 %	50 %	68 %
	2-Fluorobiphenyl	54 %	64 %	63 %	55 %	46 %	62 %
	Terphenyl-d14	83 %	72 %	72 %	92 %	82 %	83 %
	Phenol-d5	55 %	66 %	60 %	62 %	55 %	71 %
	2-Fluorophenol	45 %	68 %	63 %	63 %	52 %	70 %
	2,4,6-Tribromophenol	38 %	83 %	78 %	66 %	56 %	75 %
Phenol		10 U	82 %	80 %	10 U	10 U	81 %
bis(2-Chloroethyl)ether		10 U	77 %	76 %	10 U	10 U	80 %
2-Chlorophenol		10 U	78 %	80 %	10 U	10 U	82 %
1,3-Dichlorobenzene		10 U	61 %	61 %	10 U	10 U	58 %
1,4-Dichlorobenzene		10 U	59 %	60 %	10 U	10 U	57 %
1,2-Dichlorobenzene		10 U	63 %	63 %	10 U	10 U	61 %
2-Methylphenol		10 U	82 %	79 %	10 U	10 U	83 %
2,2'-oxybis(1-Chloropropane)		10 U	77 %	80 %	10 U	10 U	75 %
4-Methylphenol		10 U	81 %	77 %	10 U	10 U	82 %
N-Nitroso-di-n-propylamine		10 U	79 %	81 %	10 U	10 U	85 %
Hexachloroethane		10 U	57 %	59 %	10 U	10 U	52 %
Nitrobenzene		10 U	75 %	77 %	10 U	10 U	79 %
Isophorone		10 U	82 %	85 %	10 U	10 U	89 %
2-Nitrophenol		10 U	76 %	79 %	10 U	10 U	80 %
2,4-Dimethylphenol		10 U	80 %	76 %	10 U	10 U	85 %
bis(2-Chloroethoxy)methane		10 U J	55 %	39 %	10 U J	10 U	78 %
2,4-Dichlorophenol		10 U	77 %	79 %	10 U	10 U	80 %
1,2,4-Trichlorobenzene		10 U	58 %	61 %	10 U	10 U	54 %
Naphthalene		10 U	64 %	66 %	10 U	10 U	61 %
4-Chloroaniline		10 U J	4 * %	1 * %	10 U J	10 U	26 %
Hexachlorobutadiene		10 U	61 %	63 %	10 U	10 U	56 %
4-Chloro-3-methylphenol		10 U	80 %	79 %	10 U	10 U	84 %
2-Methylnaphthalene		10 U	68 %	70 %	10 U	10 U	61 %
Hexachlorocyclopentadiene		10 U	59 %	66 %	10 U	10 U	37 %
2,4,6-Trichlorophenol		10 U	80 %	84 %	10 U	10 U	74 %
2,4,5-Trichlorophenol		25 U	82 %	87 %	25 U	25 U	84 %

*= Outside of EPA CLP QC limits.

1/2/05

0000015

0000000007

Cust ID:	J10891		J10891		J10891		J107Y9		SBLKPJ		SBLKPJ BS	
RFW#:	001		001 MS		001 MSD		002		05LE0823-MB1		05LE0823-MB1	
2-Chloronaphthalene	10	U	73	%	78	%	10	U	10	U	68	%
2-Nitroaniline	25	U J	73	%	51	%	25	U J	25	U	84	%
Dimethylphthalate	10	U	80	%	84	%	10	U	10	U	86	%
Acenaphthylene	10	U	73	%	65	%	10	U	10	U	74	%
2,6-Dinitrotoluene	10	U	82	%	86	%	10	U	10	U	88	%
3-Nitroaniline	25	U J	74	%	52	%	25	U J	25	U	16	%
Acenaphthene	10	U	75	%	76	%	10	U	10	U	73	%
2,4-Dinitrophenol	25	U	124 *	%	129 *	%	25	U	25	U	66	%
4-Nitrophenol	25	U	102	%	95	%	25	U	25	U	83	%
Dibenzofuran	10	U	78	%	82	%	10	U	10	U	77	%
2,4-Dinitrotoluene	10	U	89	%	90	%	10	U	10	U	92	%
Diethylphthalate	10	U	80	%	83	%	10	U	10	U	89	%
4-Chlorophenyl-phenylether	10	U	76	%	81	%	10	U	10	U	79	%
Fluorene	10	U	80	%	84	%	10	U	10	U	81	%
4-Nitroaniline	25	U J	7 *	%	2 *	%	25	U J	25	U	35	%
4,6-Dinitro-2-methylphenol	25	U	116	%	118	%	25	U	25	U	87	%
N-Nitrosodiphenylamine (1)	10	U J	38	%	9 *	%	10	U J	10	U	56	%
4-Bromophenyl-phenylether	10	U	74	%	75	%	10	U	10	U	74	%
Hexachlorobenzene	10	U	99	%	95	%	10	U	10	U	83	%
Pentachlorophenol	25	U	128 *	%	127 *	%	25	U	25	U	96	%
Phenanthrene	10	U	82	%	80	%	10	U	10	U	84	%
Anthracene	10	U	84	%	81	%	10	U	10	U	89	%
Carbazole	10	U J	78	%	29	%	10	U J	10	U	93	%
Di-n-butylphthalate	10	U	84	%	85	%	10	U	1	J	91	%
Fluoranthene	10	U	95	%	91	%	10	U	10	U	89	%
Pyrene	10	U	77	%	78	%	10	U	10	U	84	%
Butylbenzylphthalate	10	U	78	%	80	%	10	U	10	U	90	%
3,3'-Dichlorobenzidine	10	U	0	%	0	%	10	U	10	U	4	%
Benzo(a)anthracene	10	U	81	%	81	%	10	U	10	U	88	%
Chrysene	10	U	79	%	81	%	10	U	10	U	83	%
bis(2-Ethylhexyl)phthalate	50 ~~0.6~~	~~JB~~ U	80	%	84	%	10	U	0.9	J	83	%
Di-n-octyl phthalate	10	U J	87	%	171 *	%	10	U J	10	U	88	%
Benzo(b)fluoranthene	10	U	92	%	168 *	%	10	U	10	U	82	%
Benzo(k)fluoranthene	10	U	88	%	160 *	%	10	U	10	U	88	%
Benzo(a)pyrene	10	U	88	%	135	%	10	U	10	U	86	%
Indeno(1,2,3-cd)pyrene	10	U	92	%	149 *	%	10	U	10	U	86	%
Dibenz(a,h)anthracene	10	U	97	%	167 *	%	10	U	10	U	88	%
Benzo(g,h,i)perylene	10	U	88	%	134	%	10	U	0.6	J	81	%

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

1/2/06

000000008

000016

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List — Report Date: 10/27/05 11:58

RFW Batch Number: 0510L496 — Client: TNUHANFORD RC-048 K0046 — Work Order: 11343606001 — Page: 2a

Cust ID: **SBLKPJ BSD**

Sample Information

RFW#: **05LE0823-MB1**
Matrix: WATER
D.F.: 1.00
Units: ug/L

Surrogate Recovery	Nitrobenzene-d5	69	%
	2-Fluorobiphenyl	63	%
	Terphenyl-d14	81	%
	Phenol-d5	70	%
	2-Fluorophenol	71	%
	2,4,6-Tribromophenol	74	%

Phenol		83	%
bis(2-Chloroethyl)ether		84	%
2-Chlorophenol		85	%
1,3-Dichlorobenzene		61	%
1,4-Dichlorobenzene		60	%
1,2-Dichlorobenzene		65	%
2-Methylphenol		89	%
2,2'-oxybis(1-Chloropropane)		80	%
4-Methylphenol		85	%
N-Nitroso-di-n-propylamine		89	%
Hexachloroethane		56	%
Nitrobenzene		79	%
Isophorone		90	%
2-Nitrophenol		81	%
2,4-Dimethylphenol		86	%
bis(2-Chloroethoxy)methane		58	%
2,4-Dichlorophenol		81	%
1,2,4-Trichlorobenzene		56	%
Naphthalene		62	%
4-Chloroaniline		2 *	%
Hexachlorobutadiene		55	%
4-Chloro-3-methylphenol		84	%
2-Methylnaphthalene		64	%
Hexachlorocyclopentadiene		42	%
2,4,6-Trichlorophenol		78	%
2,4,5-Trichlorophenol		85	%

*= Outside of EPA CLP QC limits.

00017

000000000

Cust ID: **SBLKPJ BSD**

RFW#: **05LE0823-MB1**

2-Chloronaphthalene	68		%
2-Nitroaniline	79		%
Dimethylphthalate	87		%
Acenaphthylene	72		%
2,6-Dinitrotoluene	90		%
3-Nitroaniline	3	*	%
Acenaphthene	74		%
2,4-Dinitrophenol	88		%
4-Nitrophenol	86		%
Dibenzofuran	79		%
2,4-Dinitrotoluene	93		%
Diethylphthalate	89		%
4-Chlorophenyl-phenylether	79		%
Fluorene	80		%
4-Nitroaniline	15		%
4,6-Dinitro-2-methylphenol	98		%
N-Nitrosodiphenylamine (1)	38		%
4-Bromophenyl-phenylether	75		%
Hexachlorobenzene	83		%
Pentachlorophenol	105	*	%
Phenanthrene	85		%
Anthracene	89		%
Carbazole	81		%
Di-n-butylphthalate	89		%
Fluoranthene	85		%
Pyrene	81		%
Butylbenzylphthalate	88		%
3,3'-Dichlorobenzidine	0		%
Benzo(a)anthracene	87		%
Chrysene	78		%
bis(2-Ethylhexyl)phthalate	80		%
Di-n-octyl phthalate	113		%
Benzo(b)fluoranthene	116		%
Benzo(k)fluoranthene	109		%
Benzo(a)pyrene	106		%
Indeno(1,2,3-cd)pyrene	108		%
Dibenz(a,h)anthracene	111		%
Benzo(g,h,i)perylene	101		%

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-048
LVL #: 0510L496
SDG/SAF # K0046/RC-048

W.O. #: 11343-606-001-9999-00
Date Received: 10-14-2005

SEMIVOLATILE

Two (2) water samples were collected on 10-13-2005.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3520C on 10-17-2005 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 10-19-2005.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. All surrogate recoveries were within acceptance criteria.
5. Fourteen (14) of one hundred twenty-eight (128) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
6. Three (3) of one hundred twenty-eight (128) blank spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
7. The method blank contained the common laboratory contaminants Bis (2-Ethylhexyl) phthalate and Di-n-butylphthalate at levels less than the CRQL. The method blank also contained the target compound Benzo (g, h, i) perylene at a level less than the CRQL.
8. Internal standard area criteria were not met for sample J107Y9. The out of criteria sample was reanalyzed on 10-20-2005 with similar results and will be available upon request. However, the GC/MS instrument was inspected for possible malfunction and was judged to be functioning properly.
9. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
11. I certify, that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data, contained in this hard-copy data package, has been authorized, by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

10/28/05
Date

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 05MS518

Initiator: SS
Date: 10-25-05
Client: TVA

Batch: 0510L496
Samples: 0215001T, BS, BSD
Method: SW846/CAWW/CLP/

Parameter: 8270
Matrix: Aqueous
Prep Batch: 05E0813

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

4-chloroaniline, & 4-nitroaniline recoveries <10% in ms+msd & BSD but OK in the BS

no recovery of 3,3'-Dichlorobenzidine in the ms, msd, bs or bsd

2. Known or Probable Causes(s)

loss during extraction due to the highly erratic chromatographic behavior of these compounds

3. Discussion and Proposed Action Other Description:

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

narrate

4. Project Manager Instructions...signature/date: 10/26/05

✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: 10/27/05 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
(1)	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
	X Project Mgr: Stone/Johnson		__ GC/LC: Kiger
__	__ Data Management: Stilwell	(2)	X MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-in: Perry
		__	__ Admin: _____
		__	__ Other: _____

QA-105-A-0805

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-048-3	Page 1 of 2
Collector: L.D. WAU	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 7L
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-H4-5		SAF No.: RC-048	Air Quality ☐
Ice Chest No.: ERC-99-056 AND ERC-03-102	Field Logbook No.: EL-1592	COA: BEGRAS6520	Method of Shipment: FED EX	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A060050		Bill of Lading/Air Bill No.: SEE OSPC	

Data Turnaround: 21 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

2 DOT Limits

Special Handling and/or Storage

~~N/A~~

COOL 4°C DAS 10/13/05

SAMPLE ANALYSIS	Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	H2SO4 to pH <2 Cool 4C	Cool 4C	Cool 4C
	Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG
	No. of Container(s)	1	1	2	1	2	1	1	1	3	2
	Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	500mL	1000mL	1000mL
		Carbon-14; Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	NO2/NO3 - 353.2	Semi-VOA - 8270A (TCL)	PCBs - 8082
Sample No.	Matrix *	Sample Date	Sample Time								
B07Y9	WATER	10/13/05	1209					X	X	X	X

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: L.D. WAU	Date/Time: 10/13/05 1220	Received By/Stored In: WCH	Date/Time: 10/13/05 1220
Relinquished By/Removed From: WCH	Date/Time: 10/13/05 1330	Received By/Stored In: FEDEX	Date/Time:
Relinquished By/Removed From: FedEx	Date/Time: 10/14/05 0910	Received By/Stored In:	Date/Time: 10/14/05 0910
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)

(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-6	Page 1 of 2

Collector: GROUNDWATER L.D. WALL	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 7L	Data Turnaround: 21 Days
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-F5-6		SAF No.: RC-048	Air Quality: ☐	
Ice Chest No.: ERC-99-051 AND ERC-03-102	Field Logbook No.: EL-1592	COA: BESRAS 6520	Method of Shipment: FED EX		
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A060050		Bill of Lading/Air Bill No.: SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

LDOT Limits

Special Handling and/or Storage

~~N/A~~

Cool 4°C PAS 10/13/05

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	H2SO4 to pH <2 Cool 4C	Cool 4C	Cool 4C
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	1	3	2
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	500mL	1000mL	1000mL
SAMPLE ANALYSIS	Carbon-14; Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	NO2/NO3 - 353.2	Semi-VOA - 8270A (TCL)	PCBs - 8082

Sample No.	Matrix *	Sample Date	Sample Time									
J10891	WATER	10/13/05	1111							X	X	X	X

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
L.D. WALL L.D. Wall	10/13/05 1125	WCH S GALE	10/13/05 1125
WCH S GALE	10/13/05 1330	FED EX	
FED EX	10/14/05 0910	V. Kennedy	10/14/05 0910

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)

(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

Matrix *: S=Soil; SE=Sediment; SO=Solid; SI=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RCRA			DATA PACKAGE: K0046		
VALIDATOR: TCP		LAB: LLI		DATE: 12/16/05	
			SDG: K0046		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J10891 J10749					
water					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? ..... Yes No (N/A)

Initial calibrations acceptable? ..... Yes No (N/A)

Continuing calibrations acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No (N/A)
Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... Yes (No) N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes (No) N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: bis(2-ethylhexyl)phthalate - 91 Vat RQL

no FB

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... (Yes) No N/A
Surrogate/system monitoring compound recoveries acceptable? ..... (Yes) No N/A
Surrogates traceable? (Levels D, E) ..... Yes No (N/A)
Surrogates expired? (Levels D, E) ..... Yes No (N/A)
MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD results acceptable? ..... Yes (No) N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... Yes (No) N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes (No) N/A
Performance audit sample results acceptable? ..... Yes No (N/A)
Comments: MS/MSD - 4 chloroaniline - J all
- 4 nitroaniline - J all no PAs
MSD - n-nitrosodiphenylamine - J all
LCS - MS/MSD - 33 dichlorobenzidine - J all

GC/MS ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD RPD values acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: ~~14 RPD's outside limits~~ 14 RPD's outside

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No N/A

Iinternal standard areas acceptable? ..... Yes No N/A

Internal standard retention times acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A
Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A
Results reported for all requested analyses? ..... Yes No N/A
Results supported in the raw data? (Levels D, E) ..... Yes No N/A
Samples properly prepared? (Levels D, E) ..... Yes No N/A
Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No N/A
Detection limits meet RDL? ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? ..... Yes No N/A
GPC check performed? ..... Yes No N/A
GPC check recoveries acceptable? ..... Yes No N/A
GPC calibration performed? ..... Yes No N/A
GPC calibration check performed? ..... Yes No N/A
GPC calibration check retention times acceptable? ..... Yes No N/A
Check/calibration materials traceable? ..... Yes No N/A
Check/calibration materials Expired? ..... Yes No N/A
Analytical batch QC given similar cleanup? ..... Yes No N/A
Transcription/Calculation Errors? ..... Yes No N/A

Comments: _____

Date: 23 January 2006
To: Washington Closure Hanford (technical representative)
From: TechLaw, Inc.
Project: 100 Area and 300 Area Component of the RCBRA Water Sampling
Subject: Wet Chemistry - Data Package No. K0046-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0046-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Method
J10891	10/13/05	Water	C	See note 1
J107Y9	10/13/05	Water	C	See note 1

1 – IC anions by 300.0 and nitrate/nitrite by 353.2.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Water Sampling Plan (DOE/RL-2005, Rev. 0, October 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within: 28 days for nitrate/nitrite, fluoride, bromide, chloride and sulfate; and 48 hours for phosphate, nitrate and nitrite.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by less than twice the limit, all nitrate, nitrite and phosphate results were qualified as estimates and flagged "J".

All other holding times were acceptable.

- **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 80% to 120%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 79% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J".

Finally, for samples with a recovery greater than 120% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 20%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All fluoride and nitrite results exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0046-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the holding time being exceeded by less than twice the limit, all nitrate, nitrite and phosphate results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an

estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All fluoride and nitrite results exceeded the RQL. Under the BHI statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-2005, Rev. 0, October 2005, *100 Area and 300 Area Component of the RCBRA Water Sampling Plan.*

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0046	REVIEWER: TLF	Project: RCBRA	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Nitrate Nitrite Phosphate	J	All	Holding time

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

GENERAL CHEMISTRY ANALYSIS, WATER MATRIX, (MG/L)

Project: WASHINGTON CLOSURE HANFORD					
Laboratory: Lionville Laboratory Inc.					
Case	SDG: K0046				
Sample Number		J10891		J107Y9	
Remarks					
Sample Date		10/13/05		10/13/05	
General Chemistry	CRDL	Result	Q	Result	Q
Bromide	0.25	0.25	U	0.25	U
Chloride	0.1	21.3		24.8	
Fluoride	0.05	0.25	U	0.25	U
Nitrite	0.05	0.25	UJ	0.25	UJ
Nitrate	0.05	37.1	J	65.4	J
Phosphate		0.25	UJ	0.25	UJ
Sulfate	0.25	54.8		66.0	
Nitrate/Nitrite	0.15	9.5		16.6	

000010

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/26/05

CLIENT: TNUHANFORD RC-048 K0046 LVL LOT #: 0510L496
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10891	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	21.3	MG/L	2.5	10.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 uJ	MG/L	0.25	1.0
		Nitrate by IC	37.1 J	MG/L	2.50	10.0
		Phosphate by IC	0.25 uJ	MG/L	0.25	1.0
		Sulfate by IC	54.8	MG/L	2.5	10.0
		Nitrate Nitrite	9.5	MG/L	0.20	10.0
-002	J107Y9	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	24.8	MG/L	2.5	10.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 uJ	MG/L	0.25	1.0
		Nitrate by IC	65.4 J	MG/L	2.50	10.0
		Phosphate by IC	0.25 uJ	MG/L	0.25	1.0
		Sulfate by IC	66.0	MG/L	2.5	10.0
		Nitrate Nitrite	16.6	MG/L	0.40	20.0

K 11/2/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-048 K0046
LVL#: 0510L496

W.O.#: 11343-606-001-9999-00
Date Received: 10-14-05

INORGANIC NARRATIVE

1. This narrative covers the analyses of 2 water samples.

2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

   LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

3. Sample holding times as required by the method and/or contract were met with the exception of Nitrite, Nitrate and Phosphate due to an instrument malfunction (see the sample chronology summary for analyses times for short hold samples).

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits.

7. The matrix spike recoveries for Bromide, Chloride, Fluoride, Nitrite, Nitrate, Phosphate, Sulfate and Nitrate Nitrite were within the 75-125% control limits.

8. The replicate analyses for Bromide, Chloride, Fluoride, Nitrite, Nitrate, Phosphate, Sulfate and Nitrate Nitrite were within the 20% Relative Percent Difference (RPD) control limit.

9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

10/31/05
Date

njp\i10-496

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-6	Page 1 of 2

Collector: DURATEK L.D. WALL
Company Contact: JOAN KESSNER
Telephone No.: 375-4688
Project Coordinator: KESSNER, JH
Price Code: 7L
Data Turnaround: 21 Days

Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa
Sampling Location: 199-F5-6
SAF No.: RC-048
Air Quality ☐

Ice Chest No.: ERC-99-051 AND ERC-03-102
Field Logbook No.: EL-1592
COA: BESRAS6520
Method of Shipment: FED EX

Shipped To: EBERLINE SERVICES (LIONVILLE)
Offsite Property No.: A060050
Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
POTENTIAL RADIOACTIVE
< DOT Limits

Special Handling and/or Storage
~~N/A~~
COOL 4°C DAS 10/13/05

	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	H2SO4 to pH <2 Cool 4C	Cool 4C	Cool 4C
Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	H2SO4 to pH <2 Cool 4C	Cool 4C	Cool 4C
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	1	3	2
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	500mL	1000mL	1000mL
SAMPLE ANALYSIS	Carbon-14; Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	NO2/NO3 - 353.2	Semi-VOA - 8270A (TCL)	PCBs - 8082

Sample No.	Matrix *	Sample Date	Sample Time										
J10891	WATER	10/13/05	1111							X	X	X	X

000014

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: L.D. Wall [signature] FDD	Date/Time: 10/13/05 1125	Received By/Stored In: S JGALE [signature] WCH	Date/Time: 101305 1125
Relinquished By/Removed From: SJGALE [signature] WCH	Date/Time: 101305 1330	Received By/Stored In: FED EX	Date/Time
Relinquished By/Removed From: Fed Ex	Date/Time: 10/14/05 0910	Received By/Stored In: V. Kennedy	Date/Time: 10/14/05 0910
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}
(2) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-048-6	Page 2 of 2
Collector DURATEK L.D. WALL	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7L / Air Quality ☐	Data Turnaround 21 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-F5-6		SAF No. RC-048	
Ice Chest No. ERL-99-052 AND ERL-03-102	Field Logbook No. EL-1592	COA BERAS6520	Method of Shipment FED EX	
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A060050		Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

LDOT Limits

Special Handling and/or Storage

~~N/A~~

Cool 4°C DAS 10/13/05

Preservation	Cool 4C	Cool 4C									
Type of Container	aG	P									
No. of Container(s)	3 c	1									
Volume	1000mL	500mL									
SAMPLE ANALYSIS	Pesticides - 8081	See item (1) in Special Instructions.									

Sample No.	Matrix *	Sample Date	Sample Time								
J10891	WATER	10/13/05	1111	X							

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
L.D. WALL	10/13/05 1125	SGALE	101305 1125
SGALE	101305 1330	FEDEX	
FEDEX	10/14/05 0910		10/14/05 0910

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-3	Page 1 of 2

Collector: L.O. WALL	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 7L; Data Turnaround: 21 Days
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-H4-5	SAF No.: RC-048	Air Quality ☐
Ice Chest No.: ERC-99-056 AND ERC-03-102	Field Logbook No.: EL-1592; COA: BESRAS6520	Method of Shipment: FED EX	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A060050	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

< DOT Limits

Special Handling and/or Storage

~~N/A~~

COOL 4°C DAS 10/13/05

			Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	H2SO4 to pH <2 Cool 4C	Cool 4C	Cool 4C
			Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG
			No. of Container(s)	1	1	2	1	2	1	1	1	3	2
			Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	500mL	1000mL	1000mL
SAMPLE ANALYSIS				Carbon-14; Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	NO2/NO3 - 353.2	Semi-VOA - 8270A (TCL)	PCBs - 8082
Sample No.	Matrix *	Sample Date	Sample Time										
J107Y9	WATER	10/13/05	1209							X	X	X	X

0000010

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
L.O. WALL / L.O. Wall FRH	10/13/05/1220	S.IGALE / WCH	10/13/05/1220
S.IGALE WCH	10/13/05 1330	FED EX	
FedEx	10/14/05 0910	[illegible signature]	10/14/05 0910

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-048-3	Page 2 of 2
Collector: L.D WAH	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 7L
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-H4-5		SAF No.: RC-048	Air Quality ☐
Ice Chest No.: ERC-99-056 AND ERC-03-102	Field Logbook No.: EL-1592	COA: BESRAS6520	Method of Shipment: FED EX	Data Turnaround: 21 Days
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A060050		Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

< DOT LIMITS

Special Handling and/or Storage

~~N/A~~

COOL 4°C DAS 10/13/05

Preservation	Cool 4C	Cool 4C									
Type of Container	aG	P									
No. of Container(s)	3	1									
Volume	1000mL	500mL									
SAMPLE ANALYSIS	Pesticides - 8081	See item (1) in Special Instructions.									
Sample No.	Matrix *	Sample Date	Sample Time								
J107Y9	WATER	10/13/05	1209	X							

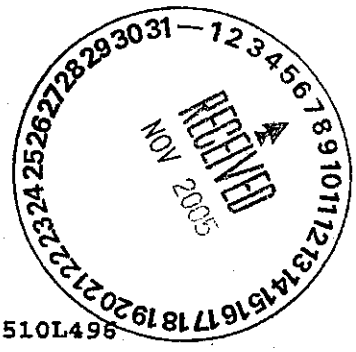
CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: L.D. WAH	Date/Time: 10/13/05 1220	Received By/Stored In: SIGNATURE ILLEGIBLE WCH	Date/Time: 10/13/05 1220
Relinquished By/Removed From: SIGNATURE ILLEGIBLE WCH	Date/Time: 101305 1530	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time: 10/14/05 0910	Received By/Stored In: SIGNATURE ILLEGIBLE	Date/Time: 10/14/05 0910
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time



Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-048 K0046

DATE RECEIVED: 10/14/05 LVL LOT # :0510L496

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS	
J10891							
BROMIDE BY IC	001	W	05LICC77	10/13/05	10/17/05	10/17/05	
BROMIDE BY IC	001 REP	W	05LICC77	10/13/05	10/17/05	10/17/05	
BROMIDE BY IC	001 MS	W	05LICC77	10/13/05	10/17/05	10/17/05	
CHLORIDE BY IC	001	W	05LICB77	10/13/05	10/17/05	10/17/05	
CHLORIDE BY IC	001 REP	W	05LICB77	10/13/05	10/17/05	10/17/05	
CHLORIDE BY IC	001 MS	W	05LICB77	10/13/05	10/17/05	10/17/05	
FLUORIDE BY IC	001	W	05LICB77	10/13/05	10/17/05	10/17/05	
FLUORIDE BY IC	001 REP	W	05LICB77	10/13/05	10/17/05	10/17/05	
FLUORIDE BY IC	001 MS	W	05LICB77	10/13/05	10/17/05	10/17/05	
NITRITE BY IC	001	W	05LICC77	10/13/05	10/17/05	10/17/05	2236
NITRITE BY IC	001 REP	W	05LICC77	10/13/05	10/17/05	10/17/05	2251
NITRITE BY IC	001 MS	W	05LICC77	10/13/05	10/17/05	10/17/05	2253
NITRATE BY IC	001	W	05LICC77	10/13/05	10/17/05	10/17/05	1458
NITRATE BY IC	001 REP	W	05LICC77	10/13/05	10/17/05	10/17/05	2317
NITRATE BY IC	001 MS	W	05LICC77	10/13/05	10/17/05	10/17/05	0008
PHOSPHATE BY IC	001	W	05LICC77	10/13/05	10/17/05	10/17/05	1346
PHOSPHATE BY IC	001 REP	W	05LICC77	10/13/05	10/17/05	10/17/05	1401
PHOSPHATE BY IC	001 MS	W	05LICC77	10/13/05	10/17/05	10/17/05	1416
SULFATE BY IC	001	W	05LICB77	10/13/05	10/17/05	10/17/05	
SULFATE BY IC	001 REP	W	05LICB77	10/13/05	10/17/05	10/17/05	
SULFATE BY IC	001 MS	W	05LICB77	10/13/05	10/17/05	10/17/05	
NITRATE NITRITE	001	W	05LN3058	10/13/05	10/25/05	10/25/05	
NITRATE NITRITE	001 REP	W	05LN3058	10/13/05	10/25/05	10/25/05	
NITRATE NITRITE	001 MS	W	05LN3058	10/13/05	10/25/05	10/25/05	
J107Y9							
BROMIDE BY IC	002	W	05LICC77	10/13/05	10/17/05	10/17/05	
CHLORIDE BY IC	002	W	05LICB77	10/13/05	10/17/05	10/17/05	
FLUORIDE BY IC	002	W	05LICB77	10/13/05	10/17/05	10/17/05	
NITRITE BY IC	002	W	05LICC77	10/13/05	10/17/05	10/17/05	0024
NITRATE BY IC	002	W	05LICC77	10/13/05	10/17/05	10/17/05	1514
PHOSPHATE BY IC	002	W	05LICC77	10/13/05	10/17/05	10/17/05	1452
SULFATE BY IC	002	W	05LICB77	10/13/05	10/17/05	10/17/05	
NITRATE NITRITE	002	W	05LN3058	10/13/05	10/25/05	10/25/05	

AB QC:

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-048 K0046

DATE RECEIVED: 10/14/05 LVL LOT # :0510L496

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BROMIDE BY IC	MB1	W	05LICC77	N/A	10/17/05	10/17/05
BROMIDE BY IC	MB1 BS	W	05LICC77	N/A	10/17/05	10/17/05
CHLORIDE BY IC	MB1	W	05LICB77	N/A	10/17/05	10/17/05
CHLORIDE BY IC	MB1 BS	W	05LICB77	N/A	10/17/05	10/17/05
FLUORIDE BY IC	MB1	W	05LICB77	N/A	10/17/05	10/17/05
FLUORIDE BY IC	MB1 BS	W	05LICB77	N/A	10/17/05	10/17/05
NITRITE BY IC	MB1	W	05LICC77	N/A	10/17/05	10/17/05
NITRITE BY IC	MB1 BS	W	05LICC77	N/A	10/17/05	10/17/05
NITRATE BY IC	MB1	W	05LICC77	N/A	10/17/05	10/17/05
NITRATE BY IC	MB1 BS	W	05LICC77	N/A	10/17/05	10/17/05
PHOSPHATE BY IC	MB1	W	05LICC77	N/A	10/17/05	10/17/05
PHOSPHATE BY IC	MB1 BS	W	05LICC77	N/A	10/17/05	10/17/05
SULFATE BY IC	MB1	W	05LICB77	N/A	10/17/05	10/17/05
SULFATE BY IC	MB1 BS	W	05LICB77	N/A	10/17/05	10/17/05
NITRATE NITRITE	MB1	W	05LN3058	N/A	10/25/05	10/25/05
NITRATE NITRITE	MB1 BS	W	05LN3058	N/A	10/25/05	10/25/05

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RCBRA			DATA PACKAGE: K0046		
VALIDATOR: TLI		LAB: LLR		DATE: 12/16/05	
			SDG: K0046		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
J10891 J10749					
					water

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No (N/A)

Initial calibrations acceptable? ..... Yes No (N/A)

ICV and CCV checks performed on all instruments? ..... Yes No (N/A)

ICV and CCV checks acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A
ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Comments: no FB

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? ..... Yes No N/A
Spike recoveries acceptable? ..... Yes No N/A
Sike standards NIST traceable? (Levels D, E) ..... Yes No N/A
Spike standards expired? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A
Comments: no PAS

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... (Yes) No N/A

Duplicate results acceptable? ..... (Yes) No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)

MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)

Field duplicate RPD values acceptable? ..... Yes No (N/A)

Field split RPD values acceptable? ..... Yes No (N/A)

Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: _____

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... (Yes) No N/A

Sample holding times acceptable? ..... Yes (No) N/A

Comments: phosphate < 2X limit J all
nitrate " " "
nitrate " " "

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: all fluoride + nitrate on

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/26/05

CLIENT: TNUHANFORD RC-048 K0046 LVL LOT #: 0510L496
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	05LICC77-MB1	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	05LICB77-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	05LN3058-MB1	Nitrate Nitrite	0.020u	MG/L	0.020	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 10/26/05

CLIENT: TNUHANFORD RC-048 K0046 LVL LOT #: 0510L496

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J10891	Bromide by IC	11.1	0.11	10.0	110.1	2.0
		Chloride by IC	134	21.3	100	112.3	20.0
		Fluoride by IC	11.2	0.059	10.0	111.3	2.0
		Nitrite by IC	11.1	0.25u	10.0	111.1	2.0
		Nitrate by IC	149	37.1	100	111.8	20.0
		Phosphate by IC	11.2	0.25u	10.0	112.1	2.0
		Sulfate by IC	172	54.8	100	117.1	20.0
		Nitrate Nitrite	21.8	9.5	12.5	97.8	25.0
BLANK10	05LICC77-MB1	Bromide by IC	4.9	0.25u	5.0	98.2	1.0
		Nitrite by IC	4.93	0.25u	5.00	98.5	1.0
		Nitrate by IC	4.88	0.25u	5.00	97.5	1.0
		Phosphate by IC	5.4	0.25u	5.0	108.3	1.0
BLANK10	05LICB77-MB1	Chloride by IC	4.6	0.25u	5.0	91.8	1.0
		Fluoride by IC	4.8	0.25u	5.0	96.2	1.0
		Sulfate by IC	4.8	0.25u	5.0	95.4	1.0
BLANK10	05LN3058-MB1	Nitrate Nitrite	0.51	0.02u	0.50	101.8	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 10/26/05

CLIENT: TNUHANFORD RC-048 K0046 LVL LOT #: 0510L496

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J10891	Bromide by IC	0.25u	0.25u	NC	1.0
		Chloride by IC	21.3	23.3	9.0	10.0
		Fluoride by IC	0.25u	0.25u	NC	1.0
		Nitrite by IC	0.25u	0.25u	NC	1.0
		Nitrate by IC	37.1	39.7	6.7	10.0
		Phosphate by IC	0.25u	0.25u	NC	1.0
		Sulfate by IC	54.8	59.8	8.8	10.0
		Nitrate Nitrite	9.5	9.6	0.73	10.0

Date: 3 January 2006
To: Washington Closure Hanford (technical representative)
From: TechLaw, Inc.
Project: 100 Area and 300 Area Component of the RCBRA Water Sampling
Subject: PCB/Pesticide - Data Package No. K0046-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0046-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Note
J10891	10/13/05	Water	C	See note 1
J107y9	10/13/05	Water	C	See note 1

1 – Pesticides by 8081A and PCBs by 8082.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Water Sampling Plan (DOE/RL-2005, Rev. 0, October 2005). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data . The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 80% to 120%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to the lack of a matrix spike, matrix spike duplicate and LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows

have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 20%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the lack of a matrix spike and matrix spike duplicate analysis, all toxaphene results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the project specific RQLs to ensure that laboratory detection levels meet the required criteria. The methoxychlor result in sample J107Y9 exceeded the RQL. Under the WCH validation statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data Package No. K0046 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of a matrix spike, matrix spike duplicate and LCS analysis, all toxaphene results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

The methoxychlor result in sample J107Y9 exceeded the RQL. Under the WCH validation statement of work, no qualification is required

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-2005, Rev. 0, October 2005, *100 Area and 300 Area Component of the RCBRA Water Sampling Plan*.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

PESTCIDE/PCB DATA QUALIFICATION SUMMARY*

SDG: K0046	REVIEWER: [illegible]	Project: RCBRA	PAGE: 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Toxaphene	J	All	No MS/MSD or LCS analysis

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PESTICIDE/PCB ANALYSIS, WATER MATRIX, (UG/L)

Project: WASHINGTON CLOSURE HANFORD					
Laboratory: LLI	SDG: K0046				
Sample Number		J10891		J107Y9	
Remarks					
Sample Date		10/13/05		10/13/05	
Extraction Date		10/18/05		10/18/05	
Analysis Date		10/21/05		10/21/05	
PCB	RQL	Result	Q	Result	Q
Aroclor-1016	0.5	0.41	U	0.40	U
Aroclor-1221	0.5	0.41	U	0.40	U
Aroclor-1232	0.5	0.41	U	0.40	U
Aroclor-1242	0.5	0.41	U	0.40	U
Aroclor-1248	0.5	0.41	U	0.40	U
Aroclor-1254	0.5	0.41	U	0.40	U
Aroclor-1260	0.5	0.41	U	0.40	U
Sample Number		J10891		J107Y9	
Remarks					
Sample Date		10/13/05		10/13/05	
Extraction Date		10/18/05		10/18/05	
Analysis Date		10/22/05		10/22/05	
Pesticide	RQL	Result	Q	Result	Q
Alpha-BHC		0.051	U	0.050	U
Gamma-BHC (Lindane)		0.051	U	0.050	U
Beta-BHC		0.051	U	0.050	U
Heptachlor		0.051	U	0.050	U
Delta-BHC		0.051	U	0.050	U
Aldrin		0.051	U	0.050	U
Heptachlor Epoxide		0.051	U	0.050	U
Endosulfan I		0.051	U	0.050	U
Dieldrin		0.051	U	0.050	U
4,4'-DDE		0.051	U	0.050	U
Endrin		0.051	U	0.050	U
Endosulfan II		0.051	U	0.050	U
4,4'-DDD		0.051	U	0.050	U
Endosulfan Sulfate		0.051	U	0.050	U
4,4'-DDT		0.051	U	0.050	U
Methoxychlor	0.05	0.051	U	0.050	U
Endrin Ketone	5	0.051	U	0.050	U
Endrin Aldehyde	5	0.051	U	0.050	U
alpha-Chlordane	5	0.051	U	0.050	U
gamma-Chlordane	5	0.051	U	0.050	U
Toxaphene	5	0.051	UJ	0.050	UJ

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 10/25/05 11:47

RFW Batch Number: 0510L496 Client: TNUHANFORD RC-048 K0046 Work Order: 11343606001 Page: 1

	Cust ID:	J10891	J107Y9	J107Y9	J107Y9	PBLKUT	PBLKUT BS
Sample Information	RFW#:	001	002	002 MS	002 MSD	05LE0825-MB1	05LE0825-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Surrogate: Tetrachloro-m-xylene		64 %	70 %	73 %	72 %	46 %	62 %
Decachlorobiphenyl		63 %	69 %	69 %	69 %	52 %	64 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		0.41 U	0.40 U	115 %	113 %	0.40 U	116 %
Aroclor-1221		0.41 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
Aroclor-1232		0.41 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
Aroclor-1242		0.41 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
Aroclor-1248		0.41 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
Aroclor-1254		0.41 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
Aroclor-1260		0.41 U	0.40 U	111 %	114 %	0.40 U	113 %

0000011

1/2/06

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

0000000004

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Report Date: 10/24/05 11:09

RFW Batch Number: 0510L496 Client: TNUHANFORD RC-048 K0046 Work Order: 11343606001 Page: 1

	Cust ID:	J10891		J107Y9		J107Y9		J107Y9		PBLKUT		PBLKUT BS	
Sample Information	RFW#:	001		002		002 MS		002 MSD		05LE0825-MB1		05LE0825-MB1	
	Matrix:	WATER		WATER		WATER		WATER		WATER		WATER	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
Surrogate: Tetrachloro-m-xylene		57	%	60	%	63	%	61	%	52	%	50	%
Decachlorobiphenyl		70	%	70	%	72	%	69	%	67	%	69	%
			fl		fl		fl		fl		fl		fl
Alpha-BHC		0.051	U	0.050	U	75	%	74	%	0.050	U	75	%
gamma-BHC (Lindane)		0.051	U	0.050	U	77	%	76	%	0.050	U	78	%
Beta-BHC		0.051	U	0.050	U	76	%	74	%	0.050	U	76	%
Heptachlor		0.051	U	0.050	U	71	%	71	%	0.050	U	72	%
Delta-BHC		0.051	U	0.050	U	81	%	79	%	0.050	U	82	%
Aldrin		0.051	U	0.050	U	74	%	75	%	0.050	U	78	%
Heptachlor epoxide		0.051	U	0.050	U	105	%	103	%	0.050	U	80	%
gamma-Chlordane		0.051	U	0.050	U	79	%	77	%	0.050	U	79	%
Endosulfan I		0.051	U	0.050	U	80	%	79	%	0.050	U	82	%
alpha-Chlordane		0.051	U	0.050	U	80	%	78	%	0.050	U	81	%
4,4'-DDE		0.051	U	0.050	U	80	%	78	%	0.050	U	80	%
Dieldrin		0.051	U	0.050	U	81	%	80	%	0.050	U	82	%
Endrin		0.051	U	0.050	U	80	%	78	%	0.050	U	81	%
4,4'-DDD		0.051	U	0.050	U	79	%	77	%	0.050	U	80	%
Endosulfan II		0.051	U	0.050	U	81	%	80	%	0.050	U	84	%
4,4'-DDT		0.051	U	0.050	U	77	%	75	%	0.050	U	78	%
Endrin aldehyde		0.051	U	0.050	U	74	%	74	%	0.050	U	76	%
Endosulfan sulfate		0.051	U	0.050	U	81	%	79	%	0.050	U	82	%
Methoxychlor		0.051	U	0.050	U	77	%	75	%	0.050	U	78	%
Endrin ketone		0.051	U	0.050	U	81	%	79	%	0.050	U	82	%
Toxaphene		0.051	U J	0.050	U J	0.050	U	0.051	U	0.050	U	0.050	U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

210012

11/2/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-048
LVL #: 0510L496
SDG/SAF # K0046/RC-048

W.O. #: 11343-606-001-9999-00
Date Received: 10-14-2005

CHLORINATED PESTICIDES

Two (2) water samples were collected on 10-13-2005.

The samples and their associated QC samples were extracted on 10-18-2005 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 10-22-2005. The extraction procedure was based on method 3520C and the extracts were analyzed based on method 8081A.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. The required holding time for extraction and analysis was met.
3. The samples and their associated QC samples received a Copper-Sulfur cleanup according to Lionville Laboratory SOPs based on SW846 method 3660A.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

10/27/05
Date

som\r:\group\data\pest\tnu hanford\0510-496.pst

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-048
LVL #: 0510L496
SDG/SAF # K0046/RC-048

W.O. #: 11343-606-001-9999-00
Date Received: 10-14-2005

PCB

Two (2) water samples were collected on 10-13-2005.

The samples and their associated QC samples were extracted on 10-18-2005 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 10-21-2005. The extraction procedure was based on method 3520C and the extracts were analyzed based on method 8082.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. The blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

10/28/05
Date

som\r:\group\data\pest\tnu hanford\0510-496.pcbs
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 2 pages.

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-048-6	Page 1 of 2
Collector DUHATEK L.D. WALL	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7L
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-F5-6		SAF No. RC-048	Air Quality ☐
Ice Chest No. ERC-99-051 AND ERC-03-102	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment FED EX	Data Turnaround 21 Days
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A060050		Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

LDOT Limits

Special Handling and/or Storage

~~WA~~

COOL 4°C PAS 10/13/05

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	H2SO4 to pH <2 Cool 4C	Cool 4C	Cool 4C
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	1	3	2
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	500mL	1000mL	1000mL

6000016

SAMPLE ANALYSIS

	Carbon-14; Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 – Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	NO2/NO3 - 353.2	Semi-VOA - 8270A (TCL)	PCBs - 8082
Sample No. / Matrix * / Sample Date / Sample Time										
J10891 / WATER / 10/13/05 / 1111							X	X	X	X

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From L.D. WALL / Date/Time 1125 10/13/05	Received By/Stored In WCH S JOALE / Date/Time 1125 10/13/05		
Relinquished By/Removed From WCH S JOALE / Date/Time 101305 1330	Received By/Stored In FEDEX / Date/Time		
Relinquished By/Removed From FEDEX / Date/Time 10/14/05 0910	Received By/Stored In T. Kennedy / Date/Time 10/14/05 0910		
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time		
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time		
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time		

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) (Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238)

(2) ICP Metals - 6010 (Full List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV)

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-6	Page 2 of 2
Collector: DURATEK L.D. WALL	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 7L; Data Turnaround: 21 Days; Air Quality ☐
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-F5-6	SAF No.: RC-048	
Ice Chest No.: ERC-99-056 AND ERC-03-102	Field Logbook No.: EL-1592; COA: BESRAS6520	Method of Shipment: FED EX	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A060050	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

2 DOT Limits

Special Handling and/or Storage

~~NA~~

Cool 4 °C DAS 10/13/05

00000012

SAMPLE ANALYSIS													
Preservation			Cool 4C	Cool 4C									
Type of Container			aG	P									
No. of Container(s)			3	1									
Volume			1000mL	500mL 3 HNO3 10/13/05									
			Pesticides - 8081	See Item (4) in Special Instructions.									
Sample No.	Matrix *	Sample Date	Sample Time										
J10891	WATER	10/13/05	1111		X								

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: L.D. WALL	Date/Time: 10/13/05 1125	Received By/Stored In: S. HALEY	Date/Time: 10/13/05 1125
Relinquished By/Removed From: S. HALEY	Date/Time: 10/13/05 1330	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time: 10/14/05 0910	Received By/Stored In: [illegible]	Date/Time: 10/14/05 0910
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

3 HNO3 10/13/05

(4) IC Anions - 300.0 {Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}

Matrix *: S=Soil; SD=Sediment; SO=Solid; SL=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-3	Page 1 of 2

Collector: L.O. WAU	Company Contact: JOAN KESSNER; Telephone No. 375-4688	Project Coordinator: KESSNER, JH	Price Code 7L; Data Turnaround 21 Days
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-H4-5	SAF No. RC-048	Air Quality ☐
Ice Chest No. ERC-99-056 AND ERC-03-102	Field Logbook No. EL-1592; COA BESRAS6520	Method of Shipment: FED EX	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A060050	Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

< DOT Limits

Special Handling and/or Storage

~~N/A~~

COOL 4°C DAS 10/13/05

00018

	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	H2SO4 to pH <2 Cool 4C	Cool 4C	Cool 4C
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P	aG	aG
No. of Container(s)	1	1	2	1	2	1	1	1	3	2
Volume	125mL	1000mL	1000mL	1000mL	1000mL	1000mL	500mL	500mL	1000mL	1000mL
SAMPLE ANALYSIS	Carbon-14; Tritium - H3	See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Radium -226; Ra-228	See item (2) in Special Instructions.	NO2/NO3 - 353.2	Semi-VOA - 8270A (TCL)	PCBs - 8082

Sample No.	Matrix *	Sample Date	Sample Time										
J107Y9	WATER	10/13/05	1209							X	X	X	X

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From FRA: L.D. WAU L.O. Wall	10/13/05/1220	Received By/Stored In WCH: SJOACE [signature]	10/13/05/1220
Relinquished By/Removed From WCH: SJOACE [signature]	10/13 05 1330	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FedEx	10/14/05 0910	Received By/Stored In: [signature]	10/14/05 0910
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) Gamma Spec - (Full List) {Americium-241, Antimony-125, Beryllium-7, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40, Ruthenium-106, Thorium-234, Uranium-235, Uranium-238}

(2) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-048-3	Page 2 of 2
Collector: L.D WAU	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 7L
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-H4-5		SAF No.: RC-048	Air Quality ☐
Ice Chest No.: ERC-99-056 AND ERC-03-102	Field Logbook No.: EL-1592	COA: BESRAS6520	Method of Shipment: FED EX	Data Turnaround: 21 Days
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A060050		Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

< DOT LIMITS

Special Handling and/or Storage

~~N/A~~ COOL 4°C DAS 10/13/05

Preservation	Cool 4C	Cool 4C									
Type of Container	aG	P									
No. of Container(s)	3	1									
Volume	1000mL	500mL									
SAMPLE ANALYSIS	Pesticides - 8081	See item (1) in Special Instructions.									
Sample No.	Matrix *	Sample Date	Sample Time								
J107Y9	WATER	10/13/05	1209	X							

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
L.D.WAU	10/13/05 1220	SIGNATURE	10/13/05 1220
SIGNATURE	10/13/05 1330	FED EX	
FED EX	10/14/05 0910		10/14/05 0910

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)

Matrix *: S=Soil; SE=Sediment; SO=Solid; SI=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHLEF-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RCBRA Water Sampl			DATA PACKAGE: K0046		
VALIDATOR: TCF		LAB: LLP		DATE: 12/16/05	
			SDG: K0046		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J10891 J10749					
				water	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations acceptable? ..... Yes No (N/A)

Continuing calibrations acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

DDT and endrin breakdowns acceptable? ..... Yes No (N/A)

Comments: _____

PCB DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No (N/A)
Calibration blank results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... (Yes) No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes (No) N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: no FB

4. ACCURACY (Levels C, D, and E)

Surrogates analyzed? ..... (Yes) No N/A
Surrogate recoveries acceptable? ..... (Yes) No N/A
Surrogates traceable? (Levels D, E) ..... Yes No (N/A)
Surrogates expired? (Levels D, E) ..... Yes No (N/A)
MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD results acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... (Yes) No N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes (No) N/A
Performance audit sample results acceptable? ..... Yes No (N/A)
Comments: no toxaphene MS/MSD/LCS J all

PCB DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... (Yes) No N/A
Duplicate results acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
Field duplicate RPD values acceptable? ..... Yes No (N/A)
Field split RPD values acceptable? ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No (N/A)
Positive results resolved acceptably? ..... Yes No (N/A)
Comments: _____

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... (Yes) No N/A
Sample holding times acceptable? ..... (Yes) No N/A
Comments: _____

PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E)	Yes	No	N/A
Compound quantitation acceptable? (Levels D, E)	Yes	No	N/A
Results reported for all requested analyses?	Yes	No	N/A
Results supported in the raw data? (Levels D, E)	Yes	No	N/A
Samples properly prepared? (Levels D, E)	Yes	No	N/A
Detection limits meet RDL?	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	N/A

Comments: methoxyclor ran in 91

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbent) cleanup performed?	Yes	No	N/A
Lot check performed?	Yes	No	N/A
Check recoveries acceptable?	Yes	No	N/A
GPC cleanup performed?	Yes	No	N/A
GPC check performed?	Yes	No	N/A
GPC check recoveries acceptable?	Yes	No	N/A
GPC calibration performed?	Yes	No	N/A
GPC calibration check performed?	Yes	No	N/A
GPC calibration check retention times acceptable?	Yes	No	N/A
Check/calibration materials traceable?	Yes	No	N/A
Check/calibration materials Expired?	Yes	No	N/A
Analytical batch QC given similar cleanup?	Yes	No	N/A
Transcription/Calculation Errors?	Yes	No	N/A

Comments: